

PI.

CONSTRUCTION AND STANDARDISATION

OF

ACHIEVEMENT TESTS

IN

GUJARATI

FOR

STANDARDS V, VI & VII

PART I

**PSYCHOLOGICAL RESEARCH INSTITUTE**

( GUJARAT RESEARCH SOCIETY )

SAMSHODHAN SADAN,

SOUTH AVENUE,

KHAR, BOMBAY-52.

1963



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INTRODUCTION

This work on Construction and Standardization of Achievement Tests in Gujarati language was undertaken by the Psychological Research Institute of the Gujarat Research Society, Bombay. In this, Achievement Tests in Gujarati, Hindi, Arithmetic, History, Geography and Science have been constructed and Standardized for Standards Fifth, Sixth and Seventh. They are based on the Syllabus of the Maharashtra and Gujarat States (Old Bombay State) for the above mentioned standards. They are meant for the Gujarati speaking School going population.

The scheme was directed by Dr. (Mrs) M.R. Shah, B.A., M.Ed., Ph.D. (Bom), Ph.D. (London) and Dr. N.N. Shukla, B.Sc., M.Ed., Ph.D.

Shri R.B. Naik, Mrs. Jolly Munshi, Kumari Bhagavati Ghaswala and Kumari Panna Adhvaryu worked as Research Assistants. Shri R.B. Naik worked as the Statistician also.

The study was made possible by a grant from the Ministry of Education, Government of India.

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CONSTRUCTION & STANDARDISATION

O F

ACHIEVEMENTS TESTS

IN

GUJARATI

FOR SUBJECTS TAUGHT

IN

BOARDS V, VI & VII

SANJAY

SEI

INTRODUCTION :

One of the most important activities of the All India Council for Secondary Education ~~at~~ since its establishment in 1955 was its efforts in the direction of reforms in Examination and Evaluation. The Bhopal Seminar organised by the Council in February 1956 gave a common platform to some of our leading educationists, secretaries of the Boards of Secondary School Examination of the various states and experienced school teachers to air their views on examination reforms. This was followed by a number of seminars and workshops on educational evaluation and testing for the lectures of the training colleges and the Head-Masters and teachers of Secondary Schools. These seminars were held at different places all over the country. They were conducted by Dr. Benjamin Bloom of the University of Chicago under the aegis of the council and have given the lead and definite programme of action for constructing a valid, reliable and objective examination, emphasised with by the University, Education Commission and the Secondary Education Commission. The council also later on decided to set up an Examination Unit. This has been now attached to the Directorate of Extension Programme for Secondary Education popularly known as DEPSE.

The Government of India has been very keen on introducing educational reforms at different levels and in different areas. To enable institutions and individuals to carry on researches and



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Though the scheme was s~~e~~ctioned in Oct such provisions is work could not actually be start~~d~~ upto Fein Secondary Education "table" early known as staff could not be which grants are given to recognised Professors February 1959 thef recognised Universities and institutions to carry on M.A., B.A.T. Projects, on problems in Secondary Education. two perso

was f~~a~~ taking keen interest in researches ~~for~~ Gujarat Research Society has been ~~for~~ its inception in 1936. It thought of construction and standardization of Intelligence Tests as far back as 1942 and had prepared an individual scale for measuring intelligence of Gujarati speaking population n Bombay. It also encouraged individual efforts for researches on problems in education by granting small research grants to students to carry on researches for their master or doctrate degrees. The keen interest of the Gujarat Research Society resulted in the birth of The Psychological Research Institute in 1954.

This Psychological Research Institute of the Gujarat Research Society submitted a scheme to the Government of India in 1957 for construction and standardization of an Achievement Test battary in Gujarati for all the subjects taught in Stds. V, VI and VII in the Old Bombay State. This scheme was approved and the Government of India was pleased to sanction the scheme vide their letter No. F.11-13/58-SE-1 dated 30th October 1958.

#### Directors in charge of the Scheme :

Dr. (Mrs) M.R. Shah, B.A., M.Ed., Ph.D. (Bom.), Ph.D. (London)., Hon. Director of the Psychological Research Institute and the then Research Officer, Primary Education of the Bombay Municipal Corporation, and Dr. N.N. Shukla, B.Sc., M.Ed., Ph.D., Full-time Director of the Psychological Research Institute were accepted as the Professors for directing the project.



Investigators :

Though the scheme was s~~e~~tioned in October 1958, the work could not actually be start~~d~~ upto February 1959, as suitable and qualified staff could not be procured during the middle of the year. Even in February 1959 the services of only two persons namely (1) Shri L.M. Vyas, M.A., B.T. and (2) Mrs. S.R. Mory, B.A., B.T. could be procured. These two persons also left for better prospects in June 1959. However, it was from June 1959 that a permanent qualified staff was available and the following full fledged staff was appointed. This staff continued to work till the project was complete.

Research Assistants :

1. Shri Ramanlal B.Naik, B.Sc., M.Ed.
2. Mrs. Jolly Munshi, B.A., M.Ed.
3. Miss Bhagwati Ghaswalla, B.A., M.Ed.
4. Miss Panna R.Adhvaryu, B.A., B.Ed. (1st Class) LL.B.

Part time clerk.

1. Miss Chandrika K.Mehta.



## C H A P T E R II

### Plan of the Work and Item Construction.

The scheme was submitted to the Ministry of Education, Government of India in March 1958 for constructing and standardizing Achievement Tests for the subjects shown in Table I.

T A B L E I

<u>Subject.</u>	<u>V</u>	<u>VI</u>	<u>VII</u>	<u>Total</u>
1. Gujarati	1	1	1	3
2. Hindi	1	1	1	3
3. Arithmetic	1	1	1	3
4. History	1	1	1	3
5. Geography	1	1	1	3
6. Science	1	1	1	3
	---	---	---	---
	6	6	6	18

It was planned so that the work could commence from June 1958, but the official sanction/<sup>of the scheme</sup> was received in October 1958. Since, then, all steps necessary to start the work were immediately taken by the psychological Research Institute, but that period being the middle of the academic year, qualified workers suitable for the projects were not available. However, all possible efforts were made to start the work with whatever staff was available and the scheme was commenced with only two persons in February 1959 as mentioned in Chapter I. These two persons also left the job for better prospect in June 1959 after serving the Institute for a few months only. Because of this difficulty of non-availability of experienced and qualified staff in the beginning, it was not possible to start the work on all the subjects simultaneously. As such the work of item



construction in Geography for standards V, VI and VII and in History for standard VI were taken up in February 1959 so that work of Pre-pilot testing in these tests could be taken up in March and April of the same year.

The work of constructing test items on the remaining subjects was taken up in hand from June 1959 when the services of the fullfledged qualified and experienced staff were available.

Laying down the objectives and Analysis of the Syllabus :

The specific objectives on the basis of the general objectives, specific objectives based on the syllabus and instructional objectives for teaching each of the objects mentioned in Table I were first formulated. These have been summarised in some of the wellknown books on Achievement Test Construction such as " Measurement and Evaluation in the Secondary School " by Greene H.A., - Jorgensen A.A., and Gerbenich J.R. and " Measuring Educational - Achievement" by Michal W.J. and Carns, " Measurement in To-day's Schools by Ross C.C. and others and hence they are not repeated here.

The syllabus prescribed for standards V, VI and VII in each of the subjects (namely, Gujarati, Hindi, Arithmetic, History, Geography and Science) by the Education Department of the then existing Bombay state was also studied and carefully analysed in the content areas.

Consideration of Relative Weightage to the Different objectives and to the different topics included in the syllabus.

It is obvious that all the objectives laid down for teaching a particular subject in a particular standard and all the topic laid down for a particular topic or a sub-topic of a subject in a particular standard cannot have importance in equal degrees. There are certain topics which are comparatively easy. Naturally they demand less time while teaching and should as a result demand less space in the test. On the other hand there are other topics which are comparatively difficult and need to be stressed more at a particular level. Naturally they demand more time while teaching and



should therefore demand more items in the test. As a natural consequence, therefore, to secure content validity, the different topics and sub-topics must be assigned proper weightage in the tests to be constructed. The weightage was determined by the following methods.

Views of Experienced Teachers.

In actual teaching, the subject teachers devote more period to the relatively more important topics. Hence their rating would serve as a rough index of relative weightage to the different topics. The syllabi of different subjects analysed in the content area as mentioned above were given to some experienced teachers in each of the subjects and they were asked to put down what percentage of period they would assign to each of the area while teaching their subjects.

Relative weightage at the Annual Examination :

It is evident that in academic examinations, the teachers would give more weightage to topics which are more important and are of higher values than others. Hence the very teachers who were asked to put down what percentage of periods they would assign to each of the area while teaching the subject were also asked to put down the marks they would allot to these topics at the Annual Examination.

Analysis of Test Books :

Author of test books who are experts in their subject matter as well as in teaching the subject generally write their test books keeping in their mind the importance of each of the topics and proportionately devote the number of pages to each of the subject areas. Hence the different text books sanctioned by the Education Department of the state in each of the subjects were also analysed and the number of pages devoted to each of the topics and sub-topics were tabulated.



The Blue Print :

From the views of the subject teachers on points discussed above and the analysis of the sanctioned text books, the final weightage was determined with the help of 10 experienced persons including the Directors of the scheme and the Research Assistants. On the basis of this, the number of items on each of the topics in the syllabus in all the subjects was fixed and a Blue Prints for each of the subjects was prepared.

Item Construction :

On the basis of these Blue Prints for each of the subjects, the test items for the 18 tests (namely 3 tests for Gujarati one for each of the standards V, VI and VII; 3 tests for Hindi one for each of the standards V, VI and VII, 3 tests for Arithmetic one for each of the standards V, VI and VII; 3 tests for History one for each of the standards V, VI and VII; 3 tests for Geography one for each of the standards V, VI and VII and 3 tests for science one for each of the standards V, VI and VII) were constructed.

Almost one and half times the total items estimated for the final tests were constructed in the beginning. Thus over 3000 items for the tests were constructed.

The Time scheduled for pre-pilot testing, pilot testing and the final run for each of the tests was then fixed up as shown in Table II. This time schedule was rigidly adhered to, to complete the whole project in time.

T A B L E II

<u>Year</u>	<u>Month.</u>	<u>Test</u>	<u>Work done</u>
1959	January	V   Geography VI   "   " VII   "   " VI   History	Preparation of the Blue prints for these four tests.
	February and March	- Do -	Item construction of these four tests.



<u>Year</u>	<u>Month</u>	<u>Test</u>	<u>Work done</u>
1959	March & April	V Geography VI " " VII " " VI History	1) Printing and 2) Administration of the pre-pilot tests.
	May & June	- Do -	1) Item analysis for these four tests and 2) Printing of the Pilot tests.
	June and July	- Do -	1) Administration of the pilot tests.
	August September October & November	- Do -	1) Item Analysis of the pilot tests, 2) Final selection of the items and 3) Printing of the tests for the final run.
	Do	Gujarati Std. V, VI, VII Hindi Std. V, VI, VII Arithmetic " V, VI, VII History V, VII Science V, VI, VII	1) Preparation of the Blue prints for these 14 tests and 2) Item construction of some of them
1959 & 1960	December January	Do	1) Completion of item construction of all these tests and 2) Printing of the tests for pre-pilot testing.
1960	January, February & March	Do	1) Administration of the pre-pilot testing.
1960	April, May & June	Do	1) Item analysis of the tests 2) Printing of the tests for the Pilot testing. 3) Pilot testing of some of the tests.
1960	June-July	Do	Administration of the remaining tests for pilot testing.
1960	August September October November December January	- Do -	1) Item analysis of these tests 2) Selection of items for the final tests and 3) Printing of the tests for the final run.
1961	January February March April May & June	- Do -	1) Administration of the final run of some of the tests and 2) Correction of test booklets of some of these tests of
	June and July	- Do -	Completion of administration of the tests of the final run of the tests. Completion correction of Test booklets.



Year	Month	Test	Work done
- - - - -			
1961	July	Gujarati Std. V	Statistical analysis
	August	Hindi " V	finding of Norms -
	September	Arithmetic " V	reliability, validity
		History " V	etc.
		Geography " V	
		Science " V	
	October	Gujarati Std. VI	
	November	Hindi Std. VI	
	December	Arithmetic " VI	- Do -
		History " VI	
		Geography " VI	
		Science " VI	
1962	January	Gujarati Std. VII	1) - Do - and
	February	" VII	2) Drafting of the
	March	Arithmetic " VII	report,
		History " VII	
		Geography " VII	
		Science " VII	

Usually testing work for any try-out should be done after the courses are completed in March and April. However as large number of pupils were to be tested (approximately 36000 to - 40,000 children) the testing had to be done in June and Jul. This was another suitable time when children though had been promoted to the higher classes had not learnt much in these new -- classes and hence were as good as in the previous class at the end of the year when they had completed their courses.

The following Tables give the Teachers rating with respect to the time they would allot to each of the content area in their subjects in the three standards under study.



TABLE

Experienced Teachers' Rating: Relative Number  
of periods Allotted to the Topics on a  
Hundred point scale



T A B L E 4

Experienced Teachers' Rating Relative Number of  
Periods Allotted to the Topics on a  
Hundred point scale

## Standard VII

Subject : Hindi

### Teachers' Rating



TABLE 5

Experienced Teachers' Rating : Relative Number  
of periods Allotted to the Topics on a  
Hundred point Scale



TABLE 6

Experienced Teachers' Rating : Relative Number  
of periods allotted to the Topics on a



TABLE 7

### Experienced Teachers' rating : Relative Number

of Periods Allotted to the Topics on a

### Hundred - point scale



T A B L E 8

Experienced Teachers' Rating : Relative Number

of periods Allotted to the Topics on a

Hundred - point scale

Standard : VII

Subject : Science

### Teachers' Rating



**T A B I E 9**

Experienced Teachers' Rating : Relative Number of periods allotted to the topics on a Hundred - point scale



TABLE 10

Experienced Teachers' Rating : Relative Number  
of periods Allotted to the Topics on a  
Hundred - Point scale

TABLE II

Experienced Teachers' Rating : Relative Number  
of periods Allotted to the Topics on a  
Hundred - Point scale



TABLE 12

Experienced Teachers' Rating : Relative Number  
of periods Allotted to the Topics on a  
Hundred - point scale

T A B L E 13

Experienced Teachers' Rating : Relative Number  
of periods Allotted to the Topics on a  
Hundred - point scale



T A B L E 14

Experienced Teachers' Rating : Relative Numbers  
of periods Allotted to the Topics on a  
Hundred - point scale

## Standard VI

Sub : Science

Teachers' Rating



T A B L E 15

Experienced Teachers' Rating : Relative Number  
of periods allotted to the topics on a  
hundred point scale

二二

Teachers' Rating

Subject : Gujarati



TABLE 16

T A B L E 17



TABLE 18

Experienced Teachers' Rating : Relative Number  
of periods Allotted to the topics on a

VI

### Teachers' Rating

Subject : History

Topic	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Average
1	3	4	5	5	3	8	5	4	6	5	6	4	7	5	8	10	5	5.4
2	10	6	8	8	7	6	10	6	9	5	8	6	10	8	10	14	8	8.2
3	14	10	12	7	9	8	12	8	12	8	12	15	5	12	8	6	7	9.4
4	3	7	5	5	5	6	4	4	5	5	7	6	7	5	3	10	12	5.8
5	2	4	5	5	4	4	6	6	6	5	4	6	2	5	4	5	12	5.0
6	6	5	6	10	7	6	6	6	5	7	7	6	4	6	6	5	5	6.0
7	6	5	6	10	4	6	6	7	5	8	7	6	9	6	6	5	5	6.2
8	4	7	6	5	5	6	5	4	5	5	6	6	6	7	4	5.4	10.3	7.0
9	10	10	11	10	10	8	12	12	11	10	11	12	11	11	8	4	6.2	12.2
10	6	8	6	7	6	8	5	7	7	7	7	12	15	16	3	4	6.2	10.0
11	6	7	6	4	5	7	5	6	5	5	8	7	6	15	3	4	6.2	10.0
12	15	15	12	14	16	14	15	14	12	16	12	5	16	12	2	3	14	12.2
13	9	6	7	5	15	7	5	8	7	6	5	8	7	7	4	4	8	6.8
14	6	6	5	4	6	4	8	5	6	4	6	3	5	6	4	8	6.1	100.0



### Experi.

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## Hundred

Standard : V

Teacher's Teacher



TABLE 10

Lenced Teachers' Rating: Relative Number  
periods Allotted to the Topics on a  
Hundred - point Scale

Subject: Science



The following tables give the Teachers rating with respect to the weightage they would give to each of the topics at the Annual Examination

TABLE 21

Experienced Teachers' Rating : Relative Marks Allotted to each Topic at the Annual Examination

Standard VI

### Teachers' Rating



TABLE 22

### Experienced Teachers' Rating

Relative Marks allotted to each Topic at the

### Annual Examination on a

Hundred Wint Scale  
C N

## Standard VII

Subject: Hindi

### Teachers' Rating



TABLE I3

Experienced Teachers' Rating : Relative Marks Allotted to each Topic at the Annual Examination on a Hundred point scale

Standard VII

#### Teachers' Ratings

Subject : Arithmetic



T A B L E 24

Experienced Teachers' Rating  
Relative Marks Allocated to each Topic at the Annual Examination on a  
Hundred Point Scale

Standard - VII

卷之三

Subject: History



TABLE 25

### Experienced Teachers' Rating

Relative Marks allotted to each Topic at the  
Annual Examination on a  
Hundred point Scale



TABLE 26

### Experienced Teachers' Rating

### Relative Marks allotted to each Topic at the

### Annual Examination on a

### Hundred point Scale

## Standard VII

Teachers' Rating

Subject : Science



TABLE 27

Experienced Teachers' Rating  
Relative Marks allotted to each Topic at the Annual Examination on a  
Hundred point Scale

Standard VI

### Teachers' Rating



T A B L E 28

Experienced Teachers' Rating  
Relative Marks allotted to each Topic at the  
Annual Examination on a  
Hundred point Scale

T A B L E 29

Experienced Teachers' Rating  
Relative Marks allotted to each Topic at the  
Annual Examination on a  
Hundred point Scale



TABLE 30

Experienced Teachers' Rating  
Relative Marks allotted to each Topic at the  
Annual Examination on a  
Hundred point Scale

T A B L E 31

Experienced Teachers Rating  
Relative Marks allotted to each topic at the  
Annual Examination on a  
Hundred point scale



TABLE 32

Experienced Teachers' Rating  
Relative Marks allotted to each topic at the  
Annual Examination on a  
Hundred point Scale



TABLE 33

Experienced Teachers' Rating  
Relative Marks allotted to each Topic at the Annual Examination on a  
Hundred point Scale

Subject : Gujarati

Teachers' Rating Standard V

### Teachers' Rating



T A B L E 34

Experienced Teachers' Rating  
Relative Marks allotted to each topic at the  
Annual Examination on a  
Hundred point Scale

TABLE 35

Experienced Teachers' Rating  
Relative Marks allotted to each topic at the  
Annual Examination on a  
Hundred point Scale



TABLE 36

Relative Marks allotted to each Topic at the Annual Examination on a Hundred point Scale

Standard V

Teachers' Rating

Subject : History

Average

Topic	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	3	5	5	4	5	8	5	3	5	6	5	7	10	10	6	4	5.4
2	10	10	5	5	9	8	5	8	15	5	10	8	10	15	15	10	10
3	16	10	15	11	9	6	15	9	12	10	7	10	5	8½	4	4	8.8
4	2	6	2½	5	5	4	5	4	6	6	7	5	7	2½	4	6	4.8
5	5	2	—	2½	5	4	2	5	6	6	6	5	2	2½	4	3	6
6	5	5	2½	10	5	8	5	5	6	6	6	5	4	2½	4	3	10
7	5	5	2½	10	5	8	5	8	6	6	7	5	9	5	4	3	5.7
8	5	7	5	4	5	8	3	6	6	6	5	8	6	15	4	10	6.3
9	10	8	15	10	12	8	12	12	15	18	18	12	10	11	20	5	11.2
10	10	8	10	10	12	8	5	3	10	5	5	10	5	10	10	8	8.7
11	10	5	10	5	8	13	4	5	5	5	8	7	10	5	5	5	6.7
12	14	15	10	13	8	10	12	15	10	12	10	8	16	10	10	5	11.0
13	5	8	10	4	10	8	5	6	8	7	5	7	7	2½	5	10	6.9
14	3	8	5	4	6	6	5	6	5	6	9	10	3	2½	10	5	10
100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100.0



TABLE 37

### Experienced Teachers' Rating

Relative Marks allotted to each topic at the  
Annual Examination on a  
Hundred point Scale



TABLE 38

Experienced Teachers' Rating  
Awarded to each topic at the Annual Examination on a  
Hundred point scale

Standard \_\_\_\_\_ V

Teachers' Rating

Subject : Science



The following Tables give the Relative Weightage given to each topic in terms of pages in the various sanctioned Text Books

T A B L E 39

Pages allotted to each Topic in various Text Books and their Average percentages

Topic	A	B	C	D	E	Percentage
1	127	145	153			59.8
2	40	40	36	41		5.6
3	60	37	49	33	58	-
4	17	8	6	11	-	3.7
	244	230	244	244	232	100.0

TABLE 40

### Pages allotted to each Topic in various Text books

And their average percentages



T A B L E 41

Pages allotted to each Topic in various Text books  
and their average percentages

Topic	Text Books			Sub: Arithmetic
	A	B	C	
1	14	11	11	8.7
2	31	20	21	17.8
3	20	11	21	12.6
4	14	23		14.4
5	15	13		10.0
6	12	10		7.1
7	15	17	13	
8	12	20	18	12.2
9	7	10	9	6.2
	140	136	134	100.0

T A B L E 42

Pages allotted to each Topic in various Text books  
and their average percentages

Topic	Text Books				Sub: History
	A	B	C	D	
1	17	20	14	24	11.50
2	30	36	31	41	21.16
3	12	7	7	4	4.62
4	12	9	13	13	7.20
5	11	6	18	3	5.82
6	16	8	7	15	7.05
7	9	11	4	7	4.75
8	9	5	6	6	3.98
9	13	7	13	19	7.97
10	7	15	11	2	5.36
11	5	5	4	7	3.22
12	7	6	10	13	5.52
13	2	6	15	9	4.92
14	13	6	16	10	6.93
	163	147	169	173	100.0



T A B L E 43

Pages allotted to each Topic in various Text books  
and their average percentages

<u>Standard VII</u>	<u>Text Books</u>			<u>Sub: Geography</u>
<u>Topic</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Percentage</u>
1	38	49	52	28.66
2	25	30	39	19.49
3	6	5	45	3.31
4	5	4	2	1.45
5	9	5	9	10%
6	18	8	12	6.66%
7	15	6	7	5.71
8	14	6	15	7.26
9	19	9	6	7.26
10	3	9	4	3.95
11	4	4	4	3.25
12	3	4	4	2.20
13	6	4	4	2.99
14	2	1	2	1.15
	161	144	157	99.30

T A B L E 44

Pages allotted to each Topic in various Text books  
and their average percentages

<u>Standard VII</u>	<u>Text Books</u>			<u>Sub: Science</u>
<u>Topic</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Percentages</u>
1	28	22	38	26.3
2	10	11	15	10.8
3	17	15	15	14.1
4	21	26	10	17.1
5	20	8	11	11.7
6	17	15	16	14.4
7	5	11	3	5.6
	118	108	108	100.0



T A B L E 45

Pages allotted to each Topic in various Text books  
and their Average percentages

<u>Standard VI</u>	<u>Text Books</u>					<u>Sub: Gujarati</u>
	A	B	C	D	E	
1	134	146	129	138	139	62.9
2	34	37	34	33	34	17.0
3	52	30	45	40	5	19.7
4	2	-	2	-	-	7.2
	222	213	210	218	218	

T A B L E 46

Pages allotted to each Topic in various Text Books  
and their Average percentages

<u>Standard VI</u>	<u>Text Books</u>							<u>Subject : Hindi</u>
	A	B	C	D	E	F	G	
1	66	74	80	72	74	63	57	61.5
2	9	5	8	15	13	7	8	8.1
3	29	31	37	30	32	38	19	27.2
4	4	2	4	2	4	2	5	3.1
	108	112	129	119	123	110	89	99.9

T A B L E 47

Pages allotted to each Topic in various Text books  
and their Average percentages

<u>Standard VI</u>	<u>Text Books</u>					<u>Sub: Arithmetic</u>
	A	B	C	D	Percentage	
1	43	54	49	43	34.4	
2	21	14	17	19	12.9	
3	9	4	4	5	4.0	
4	17	13	16	13	10.7	
5	39	18	28	38	22.4	
6	9	7	17	11	8.0	
7	9	11	9	13	7.6	
	147	121	140	142	100.0	



T A B L E 48

Pages allotted to each Topic in various Text books  
and their Average percentage

Standard VI

Sub: History

Text Books

Topic	A	B	C	D	E	Percentage
1	4	6	40	5	6	13.78
2	16	6	4	-	7.2	
3	7	5	6	-	-	
4	1	3	7	8	8	4.87
5	20	8	8	6	6	
6	6	2	7	7	7	
7	4	4	5	5	5	2.96
8	6	6	6	6	6	
9	11	6	7	7	7	
10	8	10	9	8	8	37.98
11	14	8	12	18	18	
12	27	17	20	22	22	
13	3	-	-	4	4	
14	3	3	-	9	9	
15	5	3	7	-	-	2.58
16	10	7	10	16	16	6.74
17	15	10	10	12	12	7.84
18	3	3	8	3	3	3.70
19	14	13	7	4	4	
20	2	10	9	-	-	18.65
21	10	8	-	6	6	
22	5	4	-	2	2	
23	-	-	6	3	3	
	194	142	154	160	99.10	



T A B L E 49

Pages allotted to each Topic in various Text books  
and their Average percentages

<u>Standard VI</u>	<u>Text Books</u>			<u>Sub: Geography</u>
<u>Topic</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Percentages</u>
1	5	-	12	
			13	D
2	3	-	-	Perce.
			40	5
3	7	-	4	
4	7	-	9	
5	8	-	20	9
6	6	-	-	4
7	13	-	-	13
8	4	98	3	5
9	9	7	10	11
10	11	5	8	8
11	9	5	6	9
12	9	5	6	9
13	13	5	12	14
14	10	5	12	9
15	5	7	6	6
16	4	3	3	4
17	6	6	5	4
18	6	3	5	7
	135	149	121	146
				100.00

T A B L E 50

Pages allotted to each Topic in various Text books  
and their Average percentages

<u>Standard VI</u>	<u>Text Books</u>			<u>Sub: Science</u>
<u>Topic</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Percentage</u>
1	14	13	14	10.8
2	4	6	8	4.7
3	39	40	34	29.7
4	31	23	47	26.5
5	20	30	17	17.6
6	12	18	10	10.5
	120	130	130	99.8



Pages allotted to each Topic and their Average

Standard V	in various Text books			
	A	B	C	D
Topic 1	119	129	125	123
2	24	36	27	33
3	47	34	44	40
4	8	-	-	8
5	-	-	-	-
	198	199	196	204
				194
				99.8

T A B L E 52

Pages allotted to each Topic in various Text books and their Average percentages

Standard V	Text Books							Sub: Hindi
	1	2	3	4	5	6	7	
Topic 1	58	53	67	65	54	57	57	61.04
2	5	8	16	7	12	7	8	10.2
3	31	16	30	20	26	28	20	26.3
4	2	-	2	2	3	4	3	2.14
	96	77	115	94	95	96	88	99.68

T A B L E 53

Pages allotted to each Topic in various Text books and their Average percentages

Standard V	Text Books				Sub: Arithmetic
	1	2	3	4	
Topic 1	5	22	9	35	71 14.2
2	20	17	20	10	67 13.4
3	52	43	33	20	148 29.6
4	5	10	9	9	33 6.6
5	16	17	15	9	57 11.4
6	8	6	11	4	29 5.8
7	9	17	8	4	38 7.6
8	15	13	16	13	57 11.4
	130	145	121	104	500 100.0



T A B L E 54

Pages allotted to each Topic in various Text books

and their Average percentages

Standard V

Subject: History

Text Books

Topic	A	B	C	D	Percentage
1	13	5	9	5	6.4
2	7	9	14	6	7.2
3	6	5	7	10	8.7
4	3	5	5	2	
5	4	9	5	4	4.4
6	1	2	4	2	1.8
7	4	5	6	2	3.4
8	12	7	8	8	7.08
9	6	7	8	8	5.8
10	7	6	13	4	9.7
11	6	7	8	9	6.07
12	8	5	10	7	6.07
13	9	3	8	5	14.5
14	9	13	7	3	
15	2	5	5	3	
16	4	5	6	5	
17	4	4	6	3	
18	11	4	2	5	
19	-	6	9	17	10.9
	116	112	140	108	99.42



T A B L E 55

Pages allotted to each Topic in various Text Books  
and their Average percentages

<u>Standard V</u>	<u>Text Books</u>			<u>Subject: Geography</u>	
<u>Topic</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Total</u>	<u>Percentage</u>
1	7	-	6	13	
2	11	11	28	50	
3	4	-	5	9	
4	5	6	12	23	34.30
5	7	5	8	20	
6	4	5	7	16	
7	4	5	6	15	
8	7	5	3	15	3.56
9	6	-	3	9	2.13
10	7	9	3	19	4.51
11	7	8	7	22	5.22
12	6	2	5	13	3.08
13	8	2	4	14	3.31
14	5	2	7	14	3.31
15	6	6	5	17	4.03
16	7	5	-	12	2.85
17	5	6	4	15	
18	5	6	4	15	
19	6	6	5	17	28.60
20	4	12	10	26	
21	6	8	4	18	
22	6	5	6	17	
23	6	6	5	17	
24	2	2	4	8	1.60
25	4	6	6	16	3.50
	145	128	157	439	100.0



T A B L E 56

Pages allotted to each Topic in various Text Books  
and their average percentages

Standard V

Text Books

Subject: Science

Topic	A	B	C	D	Percentage
1	19	29	25	29	26.7
2	20	15	3	13	13.3
3	15	14	16	19	16.7
4	19	20	18	10	17.5
5	10	18	23	9	15.7
6	14	7	6	5	8.3
	97	103	91	85	98.2



The following tables are the Blue Prints showing final weightage given to each of the topics in the various subject in the three Standards.

T A B L E 56

Table showing the final weightage fixed, based on (1) the Teachers' rating - (a) Relative number of periods allotted to each topic (b) Relative marks assigned to those topic at the final examination and (2) The Analysis of the Sanctioned Text Books

Standard VII		Subject: Gujarati			
No.	Topic	Teachers' Rating Periods	Text Book	Final Marks	weightage fixed
1	Prose	35.3	33.2	59.8	42.9
2	Poetry	21.8	21.9	16.6	19.9
3	Rapid Reader	8.5	8.9	-	5.8
4	Grammer	12.0	13.1	19.9	15.1
5	Composition	22.4	22.9	3.7	16.3
		100.0	100.0	100.0	100.0

T A B L E 57

Table showing the final weightage fixed, based on (1) the Teachers' rating - (a) Relative number of periods allotted to each topic (b) Relative marks assigned to those topic at the final examination and (2) The Analysis of the sanctioned Text Books

Standard VII		Subject : Hindi			
No.	Topic	Teachers' Rating Periods	Text Books	Final Marks	weightage fixed
1	Prose	38.2	31.3	63.9	44.5
2	Poetry	20.7	19.5	8.5	16.3
3	Grammer	13.4	13.7	22.5	16.5
4	Composition	23.8	25.5	5.1	18.1
5	Oral work	3.9	10.0	-	4.6
		100.0	100.0	100.0	100.0



T A B L E 58

Table showing the final weightage fixed, based on  
(1) the Teachers' rating - (a) Relative number -  
of periods allotted to each topic at the final  
examination and (2) The Analysis of the sanctioned

Text Books.

Topic	Teachers Rating Periods	Text Book	Final weightage fixed	
			Marks	
1 Simple Interest	7.6	7.1	8.7	7.8
2 Compound Interest	15.4	14.6	17.8	15.7
3 Ratio & Proportion partnership	18.9	18.8	12.6	16.8
4 Time, transport, and speed work and wages	12.6	13.3	14.4	13.4
5 Household Accounts and Family Budget	8.2	9.0	10.0	9.2
6 Scale drawing and finding distances on a map	6.9	7.5	7.1	7.2
7 Demonstration of the property of vertically opposite angles etc.	11.0	11.7	11.0	11.2
8 Area of a Circle	9.8	9.1	12.2	10.4
9 Cubic Measure	9.6	8.9	6.2	8.3
	100.0	100.0	100.0	100.0



T A B L E 59

Table showing the final weightage fixed, based on  
 (1) the Teachers' rating - (a) Relative number -  
 of periods allotted to each topic at the final  
 examination and (2) The Analysis of the sanctioned

Text Books

Standard VII

Sub: History

No.	Topic	Teachers Rating Periods	Marks	Text Book.	Final weightage fixed
1	The Rivalry between the European powers	9.4	11.50	11.5	10.1
2	The establishment and consolidation of British Rule in India	15.9	21.16	21.2	18.4
3	The Indian War of Independence 1957	4.7	4.61	4.6	4.9
4	Renaissance in India	6.6	7.24	7.2	6.9
5	Growth of Nationalism in India	6.7	5.82	5.8	6.7
6	Birth and development of the Indian National Congress.	8.4	7.05	7.0	8.2
7	Mahatma Gandhi's Satyagrah Movement.	4.0	4.75	4.8	4.6
8	The world War I and its effects	4.9	3.98	4.0	4.6
9	Non-Co-operation and Satyagrah movements	7.7	7.97	8.0	7.3
10	The First Congress Government in the provinces	4.8	5.36	5.4	5.1
11	The World War II	5.4	3.22	3.2	4.5
12	The Independence of India	5.6	5.52	5.5	5.4
13	How India is governed now.	6.2	4.90	4.9	5.5
14		9.7	6.92	6.9	7.8
		100.0	100.0	100.0	100.0



T A B L E 60

Table showing the final weightage fixed, based on  
(1) the Teachers' rating - (a) Relative number  
of periods allotted to each topic at the final  
examination and (2) The Analysis of the sanctioned

Text Books

Standard VII

Sub: Geography

<u>Topic</u>	<u>Teachers' Ratings</u> <u>Periods - Marks</u>	<u>Text Book</u>	<u>Final weightage fixed.</u>
1 Study of India w.r. to location, size, relief climate, rainfall etc.	23.30	22.70	28.66 24.89
2 India's wealth in water-power, Forest and Sea produce, minerals etc.	19.60	20.90	19.49 20.00
3 Imports and Exports.	4.35	5.17	3.31 4.28
4 Languages of Indian people	4.21	4.39	2.45 3.68
5 Australia	4.78	5.07	4.96 4.94
6 Great Britain	5.14	4.57	6.66 5.46
7 U.S.A.	5.35	4.42	5.71 5.16
8 U.S.S.R.	5.00	4.07	7.26 5.44
9 South & East Africa	5.00	3.78	7.26 5.35
10 Altitude & Latitude	5.28	4.78	3.95 4.67
11 Standard and local time	4.50	4.00	3.25 3.92
12 Climate Zones	4.21	4.28	2.20 3.56
13 Seasons	4.44	4.21	2.99 3.88
14 Outline Map of India	4.50	6.57	1.15 4.07
	99.66	98.91	99.30 99.30



T A B L E 61

Table showing the final weightage fixed, based on  
 (1) the Teachers' rating - (a) Relative number  
 of periods allotted to each topic at the final  
 examination and (2) The Analysis of the sanctioned

Text Books

Standard VII	Sub: Science			
Topic	Teachers' Rating	Text Book.	Final weightage fixed	
	Periods - Marks			
1 Air	21.07	20.8	26.3	22.70
2 Water	10.97	11.3	10.8	10.70
3 Food	13.43	14.7	14.1	14.10
4 Movement	15.86	15.0	17.1	16.00
5 Senses	18.43	17.2	11.7	15.80
6 Reproduction	14.28	14.5	14.4	14.40
7 Study of the sky	6.86	6.5	5.6	6.30
	100.0	100.0	100.0	100.00

T A B L E 62

Table showing the final weightage fixed, based on  
 (1) the Teachers' rating - (a) Relative number  
 of periods allotted to each topic at the final -  
 examination and (2) The Analysis of the sanctioned

Text Books

Standard VI	Sub: Gujarati			
Topic	Teachers' Rating	Text Book	Final weightage fixed	
	Periods - Marks			
1 Prose	37.30	33.5	62.9	45.8
2 Poetry	21.05	21.8	17.0	20.5
3 Rapid Reader	9.30	9.2	-	3.3
4 Grammer	10.60	12.3	19.7	14.8
5 Composition	21.80	23.2	0.4	15.6
	100.00	100.0	100.0	100.0



T A B L E 63

Table showing the final weightage fixed, based on  
 (1) the Teachers' rating - (a) Relative number  
 of periods allotted to each topic at the final  
 examination and (2) The Analysis of the sanctioned

Text Books

<u>Standard VI</u>	<u>Sub: Hindi</u>			
<u>Topic</u>	<u>Teachers Rating</u>		<u>Text Book</u>	<u>Final weightage fixed</u>
	Periods	Marks		
1. Prose	35.5	30.9	61.5	42.6
2. Poetry	23.3	22.7	8.1	18.03
3. Grammer	12.4	15.4	27.2	18.30
4. Composition	21.8	19.3	3.1	14.70
5. Oral Work	6.8	11.5	-	6.04
	99.8	99.8	99.9	99.67

T A B L E 64

Table showing the final weightage fixed, based on  
 (1) the Teachers' rating - (a) Relative number  
 of periods allotted to each topic at the final  
 examination and (2) The Analysis of the sanctioned

Text Books

<u>Standard VI</u>	<u>Sub: Arithmetic</u>			
<u>Topic</u>	<u>Teachers' Rating</u>		<u>Text Book</u>	<u>Final weightage fixed</u>
	Periods	Marks		
1 Fractions and Decimal Fractions.	29.9	27.8	34.4	30.7
2 Percentage	17.1	19.3	12.9	16.4
3 Exchange	6.03	7.9	4.0	6.0
4 Profit and Loss	13.9	11.8	10.7	12.1
5 Angles	22.3	18.8	22.4	21.2
6 Postal and Telegraphic Information	4.8	6.8	8.0	6.5
7 Column Graphs	5.9	7.5	7.6	7.0
	99.93	99.9	100.0	99.9



T A B L E 65

Table showing the final weightage fixed, based on  
(1) the Teachers' rating - (a) Relative number of  
periods allotted to each topic at the final -  
examination and (2) The Analysis of the sanctioned

Text Books

<u>Standard VI</u>	<u>Subject: History</u>			
<u>Topic</u>	<u>Teachers' rating</u> <u>Periods - Marks</u>	<u>Text Books</u>	<u>Final weightage signed.</u>	
1. Political and Social conditions in India	10.76	9.70	13.78	11.51
2 The advent of the Muslims	9.69	10.41	4.87	8.42
3 The Vijayanagar and Bahmani Kingdoms	4.46	7.03	2.96	4.82
4 Establishment of Moghul Power	4.19	5.07	-	3.10
5 Akbar the great	28.61	25.20	37.98	30.60
6 Jahangir, Shahjahan and Aurangzeb	3.84	5.44	2.58	3.95
7 Rise of the Sikhs	5.69	6.61	6.74	6.40
8 Religious movements in India	4.96	7.18	7.84	6.76
9 Shivaji the great	4.34	5.23	3.70	4.42
10 The First Four Peshwas	22.76	18.13	16.40	19.60
	99.63	100.00	99.10	99.58



T A B L E 66

Table showing the final weightage fixed, based on

(1) the Teachers' rating - (a) Relative number of periods allotted to each topic at the final examination and (2) The Analysis of the Sanctioned -

Text Books

Standard VI

Sub: Geography

No.	Topic	Teachers' Rating Periods - Marks	Text books	Final weightage fixed
1	Detailed study of India	43.61	39.15	48.60 43.39
2	Pakistan	5.38	5.76	6.65 5.92
3	Burma	5.38	5.76	5.73 5.62
4	Ceylon	5.46	5.92	5.19 5.52
5	Indonesia	5.38	5.84	5.19 5.47
6	China	6.15	6.48	7.87 6.80
7	Japan	5.84	5.84	6.45 6.04
8	Shape & size of the Earth	5.46	6.76	4.60 5.55
9	Phenomenon of day and night	5.07	6.10	2.40 4.52
10	Monsoons as affecting the countries in South-east Asia	6.46	6.30	3.66 5.54
11	Rainfall - evaporation and condensation	5.43	5.76	3.66 4.92
		99.65	99.67	100.00 99.35



T A B L E 67

Table showing the final weightage fixed, based on  
 (1) the Teachers' rating - (a) Relative number of  
 periods allotted to each topic at the final examination and (2) The Analysis of the sanctioned  
Text Books

<u>Standard VI</u>		<u>Subject: Science</u>			
No.	Topic	Teachers' Rating Periods	Text Marks	book	Final Weightage fixed
1	Air	15.06	15.5	10.8	13.7
2	Water	8.52	10.7	4.7	8.0
3	Food	28.02	26.4	29.7	28.1
4	Movement	23.50	21.9	26.5	24.0
5	Senses	17.84	16.0	17.6	17.0
6	Study of the sky	7.06	9.5	10.5	9.1
		100.00	100.0	99.8	99.9

T A B L E 68

Table showing the final weightage fixed, based on  
 (1) the teachers' rating - (a) Relative number of  
 periods allotted to each topic at the final examination and (2) The Analysis of the sanctioned  
Text Books

<u>Standard V</u>		<u>Sub: Gujarati</u>			
No.	Topic	Teachers' Rating Periods	Text Marks	books	Final weightage fixed
1	Prose	34.7	33.8	61.4	43.1
2	Poetry	20.1	21.8	15.4	19.1
3	Rapid Reader	9.2	8.6	-	5.9
4	Grammer	11.4	11.7	21.4	14.8
5	Composition	24.6	24.1	1.6	16.4
		100.0	100.00	199.8	99.9



T A B L E 69

Table showing the final weightage fixed, based on  
 (1) the teachers' rating - (a) Relative number of  
 periods allotted to each topic at the final exam-  
 ination and (2) The Analysis of the sanctioned  
Text Books

No.	Topic	<u>Standard V</u>		<u>Sub: Hindi</u>	
		Teachers' Rating Periods	Marks	Text Book	Final weightage fixed
1	Prose	38.4	29.5	61.04	42.98
2	Poetry	22.9	20.1	10.2	17.73
3	Grammer	12.5	14.7	26.3	17.83
4	Composition	19.4	23.8	2.14	15.11
5	Oral Work	6.8	11.9	-	6.20
		100.0	100.00	99.98	99.85

T A B L E 70

Table showing the final weightage fixed, based on  
 (1) the teachers' rating - (a) Relative number of  
 periods allotted to each topic at the final exam-  
 ination and (2) The Analysis of the sanctioned  
Text Books

No.	Topic	<u>Standard V</u>		<u>Sub: Arithmetic</u>	
		Teachers' Rating Periods	Marks	Text books	Final weightage fixed
1	Revision of simple and compound rules	5.3	7.3	14.2	8.8
2	G.C.M. and L.C.M. etc.	15.5	13.8	13.4	14.2
3	Fractions	35.2	32.0	29.6	32.3
4	Averages	6.2	8.6	6.6	7.2
5	Unitary and Fractional methods in proportion	12.4	12.6	11.4	12.1
6	Preparing Bills and receipts etc.	5.3	8.3	5.8	6.5
7	Familiarity with Right angle, Rectangle	13.0	10.5	7.6	10.4
8	Square and rectangle etc.	7.1	6.9	11.4	8.5
		100.0	100.0	100.0	100.0



T A B L E 71

Table showing the final weightage fixed, based on  
(1) the teachers' rating - (a) Relative number of  
periods allotted to each topic at the final examination and (2) The Analysis of the sanctioned

Text Books

<u>Standard V</u>		<u>Subject: History</u>		
No.	Topic	Teachers' Rating Periods	Text Marks	Final Book weightage fixed
1	Apana Desh	5.4	5.4	6.4 5.76
2	Indus Valley Civilization.	8.2	9.0	7.2 8.18
3	Advent of Aryans	9.4	8.8	8.7 8.99
4	Bharat after the advent of Aryans	5.8	4.8	4.4 5.05
5	Bharat before Mahavir	5.0	4.0	1.8 3.74
6	Mahavir Swami	6.0	5.4	3.4 4.95
7	Gauttam Buddha	6.2	5.7	7.08 6.36
8	Alexander the great and Porous	5.4	6.3	5.8 5.96
9	Chandragupta Maurya	10.3	11.2	9.7 10.40
10	Ashok the great	7.0	8.7	6.07 7.26
11	Kanishka the great	6.2	6.7	6.07 6.33
12	Guptas	12.2	11.0	14.5 + 12.31
13	Harsha and Pulakeshin II	6.8	6.9	7.4 7.04
14	Travels of Hieuen Tsang	6.1	6.1	10.9 7.50
		100.0	100.0	99.42 99.83



T A B L E 72

Table showing the final weightage fixed, based on  
(1) the teachers' rating - (a) Relative number of  
periods allotted to each topic at the final exam-  
ination and (2) The Analysis of the sanctioned

Text Books

Standard V

Sub: Geography

<u>Topic</u>	<u>Teachers' Rating</u> <u>Periods - Marks</u>	<u>Text Books</u>	<u>Final weightage fixed</u>
1. Study of lives and occupations of the people of India.	28.30	26.70	34.30
2 Desert of Marwar	3.15	3.38	3.56
3 Panjab	3.69	3.76	2.13
4 Kashmir	3.86	4.38	4.51
5 Ganges	4.65	5.38	5.22
6 Bengal	3.84	4.07	3.08
7 Assam	3.69	4.15	3.31
8 Mysore	3.69	4.23	3.31
9 Tamilnad	3.84	3.92	4.03
10. Kerala	3.30	4.00	2.85
11. Homes and occupations of some people	30.30	20.80	28.60
12 Observation of shadow	3.38	3.50	1.60
13 Observation of changes in Nature in Different - seasons.	4.38	5.73	3.50
	100.00	100.00	100.00



T A B L E 73

Table showing the final weightage fixed, based on  
(1) the teachers' rating - (a) Relative number of  
periods allotted to each topic at the final -  
examination and (2) The Analysis of the sanctioned

Text Books

Standard	V	Subject: Science		
No.	Topic	Teachers' Rating Period	Text Marks	Final weightage fixed
1	Air	18.9	17.3	21.0
2	Water	20.8	22.2	18.8
3	Food	15.8	17.9	16.8
4	Movement	15.2	13.5	15.4
5	Senses	16.7	16.7	16.4
6	Study of the sky	12.6	12.4	11.1
		100.0	100.0	98.2 99.5



## CONSTRUCTION OF THE TEST ITEMS

### Study of Some Existing Tests :

Some standardised tests that were available in the subjects under study were critically studied before the items of the present tests were constructed.

### Types of the Tests selected :

Objective tests can broadly be classified into two main parts. (1) Recall type tests (2) Recognition type tests. Both these types have their merits as well as limitations. However, it is essential to use all these different types of tests to measure all the four different levels of Knowledge. It seems reasonable to assume that the type of tests used must be appropriate to the level of knowledge being measured. Tests of Multiple choice and Matching types appear adequate for the first level of knowledge. Recall tests may be required for the other three levels. . . understanding, evaluation, application and many other aspects of thinking can be measured by recognition tests. \*

The following types were selected in the present 18 tests according to the need of the subject and the standard.

- a) Recall type-tests.
  - 1) Simple Recall tests.
  - 2) Completion Tests.
- b) Recognition type-tests
  - 1) Multiple-choice tests
  - 2) Matching tests
  - 3) True-false tests.
- c) Figure tests

Each of the above type of tests has its own merits and limitations. All these were borne in mind while constructing the test items.

\* Ross C.C. "Measurement in To-day's School"  
Printice Hall Inc. 1956 P.166-167



The Source of Items :

Lindquist Suggests " Text books, course outlines, statement of objectives, tests of essential principles or basic abilities or frequent errors or common misunderstandings, discussion questions and even questions from their tests are likely to suggest useful item ideas " \*

In the present experiment the following sources were consulted for item writing :

- a) Text books on the subjects;
- b} Frequent errors of pupils;
- c} Question papers,
- d) Standard Tests on the subjects.

a) Text books on the subjects :

Text Books on the various subjects for standards V, VI and VII sanctioned by the Education Department of the state were studied critically. Teaching points were noted for item construction.

b) Frequent errors of the pupils

" A second type of material which is likely to stimulate the production of item ideas is provided by the written work of the students themselves. Their expression of ideas on issues and problems may reveal points of difficulty which can be the basis of discriminating test items" (\*) Frequent errors of the pupils were noted for item - writing from the following courses.

- 1) Teaching experiences of the Research Assistants  
(They had atleast 3 to 5 years teaching experience in the subject)
- 2) Examination of answer-books of pupils of one or two schools.
- 3) From discursion with some of the experienced teachers.

c) Question papers :

Question papers set at the Terminal and Annual Examination of several schools were also studied.

\* Lindquist E.F. " Educational Measurement" American Council of Education, Washington D.C, 1955 P.191

(\*) Ibid. P. 191



d) Standardised Tests

Some standardised tests in the various subjects were also studied.

Review of the items :

The items constructed were reviewed by the Research Assistants and Directors of the scheme from the following view points:

- 1) Technical Points : Principles of measurement.
- 2) Subject matter :
  - a) appropriateness of content.
  - b) Accuracy of the scoring key.
- 3) Editorial quality :
  - a) consistency of the test items.
  - b) avoiding undesirable overlapping.
  - c) accuracy of language.

Two experienced teachers in each of the subjects were requested to review the draft items. Their suggestions were invited. The draft of the items was given to a specialist in the language for checking flaws in the language if any.

Each sub-test contained more than double the number of items. However, to economise space the results pertaining to only those items that were finally selected have been included in this report.

Arrangement of the Text Items.

There are two main methods of arranging the test items.

- 1) Discrete method; (2) Omnibus method.

(1) Discrete Method :

In this method, the items of the same type are arranged in one sub-test, generally in ascending order of difficulty. All the sub-tests selected are arranged one after another. Every sub-test is timed separately.

(2) Omnibus Method :

In this method, all the items are arranged in ascending order of difficulty, irrespective of types. The test as a whole has an over-all time limit.

The Two methods and the present Experiments

The method adopted for the present experiment is a blending of both the methods (i) discrete method and (ii) omnibus method.



The items were arranged according to discrete method, but each sub-test was not timed separately. The whole test was given an over-all time-limit. Administration of the test was made simple. Instructions with worked out examples were given in the begining of each sub-test.

The administrator distributes test-booklets and pupils are asked to fill in the names and other particulars and to read the directions carefully. A test is to be administered within a given over-all time-limit.

\* \* \* \*



C H A P T E R IIIP R E - T R Y O U T

Once the test items are constructed and reviewed the test constructor is anxious to know how the items would work. The tests were therefore pre-tried. E.F. Lindquist defines the pre-pilot test as "The Preliminary administration of the tentative try-out units to small samples of examinees for the purpose of discovering gross deficiencies, but with no intention of analysing pre-tryout data for individual items."<sup>1</sup> Pre-pilot test can be called a grand rehearsal of the pilot test. In this stage, omissions, ambiguities or inadequacies in the items or directions may be discovered. The main purpose of pre-tryout are :<sup>2</sup>

1. To identify weak or defective items and to reveal needed improvement.
2. To determine the difficulty of each individual item.
3. To find out major omissions, ambiguities or inadequacies in the directions to examinees.
4. To determine the amount of time that should be allowed in the later tryout administration.
5. To determine the inter correlation among the items in order to avoid overlap in the item selection.

Administering the Pre-Pilot Tests :

The sub-tests of each of the 18 tests were grouped together and printed on separate sheets.

The Pre-tryout for the test was carried out during the last week of March or the first week of April, 1959 or 1960. The whole procedure was very informal. The sub-tests were administered to pupils under normal conditions in a homely

<sup>1</sup> Lindquist E.F., Editor, "Educational Measurement" American Council on Education, Washington, D.C. 1955, P. 251.

<sup>2</sup> Ibid P. 250-252.



environment of their own classrooms. The pupils were taken into confidence and attempts were made to collect maximum information and to collect students reactions - every time the tests were administered. They were allowed to ask questions if they did not follow any instructions. All the sub-tests were administered separating one after another during the working hours of the Schools. To have a uniform procedure it was decided that each Research Assistant should

- (1) see that the student fills in his or her name and other information on the right hand top of the sheet.
- (2) take care that no pupil copies from his neighbour.
- (3) record accurately the time (in minutes) taken by every pupil when he submits his sheet.
- (4) note everything which the pupils ask him.
- (5) note the impression of the pupils about the test on the whole.
- (6) give suggestions if there were any.

As the pupils were not familiar with and accustomed to such test forms (even in a city like Bombay), it was decided and to read/explain the following instructions to students after distributing the test sheets in the class.

- (1) Please fill in your name and other details carefully.
- (2) This is not an examination. It is simply a test of your knowledge.
- (3) Do not start writing before I ask you to start.
- (4) You have not to write long sentence but you have to answer the questions briefly in a word, phrase or number.
- (5) You are given complete direction with an illustration. Please read the same carefully and try the questions accordingly.
- (6) You will be given as much time as you want. However do not stop when you do not know a thing and waste your time. Leave that question and proceed further without wasting time.
- (7) Do not try even to peep in your neighbours' paper.
- (8) When you finish the test-sheet hand-over the same immediately to the supervisor. It is not at all necessary to revise the sheet again as you do in your examination.



Sampling :

Each of the sub-test was administered on boys and girls studying in standards V, VI and VII. To avoid biased sampling the schools situated in different localities which would include children from all the strata of the society. They roughly included all the economical, social and intellectual levels.

The following table shows the names of schools, locality and the number of students tested.

T A B L E

Name of the School.	Locality	No. of Students
1. Manilal Sunderji Municipal School, Vile Parle,	Vile Parle	100 for each test.
2. Pupils' Own School, Khar	Khar	" "
3. Lilawanti Kabubai High School, Sandhurst Road, Bombay.	Sandhurst Road & Girgaum	" "



All the sub-tests were separately administered to 100 students of each standards. They included both boys and girls.

Time Limit :

As our main purpose of try-out is to collect accurate data about each item, it is extremely important that there should be no time-limit so as to permit all the students to attempt every item on which pre-tryout data are desired. However time taken by each student to complete each sub-test was recorded on the right-hand top corner of the test-sheet.

The average time taken by pupils for each sub-test was calculated. On the basis of this the approximate time limits for each of the tests under construction were determined.

T A B L E 75

Table showing Rough Time limit in seconds per item in each of the Sub-Tests of Std. V

	V	Standard VI	Standard VII		
Gujarati	Hindi	Arithmetic	History	Geography	Science
12.4.9	12.9	25.4	12.08	9.4	11.23
10.21	49.5	34.4	20.6	11.3	20.28
26.37	16.1	30.7	11.8	16.7	16.67
20.20	7.9	48.9	22.6	12.4	19.23
46.46	36.6	42.6	28.01	24.3	35.49
10.69	17.3	42.03	12.5	26.8	24.28
33.0	51.7	33.8	21.9	21.2	16.39
12.28	21.5	-	-	-	-



T A B L E 76

Table showing Rough time limit in seconds per item in each of the Sub Tests of Std. VI

Sub Test No.	Gujarati	Hindi	Arithmetic	History	Geogra-phy.	Sci-ence.
1	28.42	8.7	30.87	21.4	7.4	10.4
2	24.02	11.5	16.40	18.2	16.7	16.01
3	27.23	15.8	22.63	14.1	18.3	10.3
4	12.45	11.9	52.15	26.0	16.4	24.4
5	18.02	30.4	49.77	8.12	22.4	26.60
6	37.79	36.2	56.69	26.9	34.4	19.79
7	12.59	14.08	57.25	29.1	24.0	16.4
8	22.34	66.53	-	-	-	-
9	-	17.6	-	-	-	-

T A B L E 77

Table showing Rough Time limit in seconds per item in each of the Sub Tests of Std. VII

Sub Test No.	Gujarati	Hindi	Arithmetic	History	Geogra-phy.	Sci-ence.
1	9.53	11.4	47.3	16.9	9.1	8.9
2	9.34	37.0	45.67	28.5	15.4	19.5
3	10.04	18.3	68.9	13.6	12.8	18.6
4	12.05	10.4	57.2	17.3	31.5	21.7
5	6.84	20.7	51.7	20.9	20.8	18.0
6	14.0	26.3	91.02	18.2	25.2	31.4
7	24.38	9.9	48.6	26.4	73.8	11.1



Scoring :

Before administering the test the method of scoring was determined. The test was then scored according to this pre-determined method. Items were not given any weightage from the view point of either the estimated difficulty or importance. Each correct response carried one point. No formula for correction was applied in scoring. Total number of students giving right answers and the total number of students giving wrong answers for each item of each sub-test were found out.

Scrutinising of Items :

Pre-try out was carried out on a small sample with a view to having a rough estimate about the working of each item. The total score of each examinee was of very little interest at that stage. The number of students giving correct responses and wrong responses for each item gave directly the percentage as the total number of students tested was one hundred. This was useful to find how difficult the items were. Except a few items of the two extreme levels, items having very high percentage or very low percentage of correct responses were discarded. Majority of the items selected were from the middle level.

Modification of Items :

The faulty items were rejected. However, there were a number of items which were modified so as to become better items than what they were at the beginning.

Test Booklets for Pilot Testing :

The revised matter was printed in the form of booklets for all the 18 tests.



The following points were borne in mind while preparing test booklets :

- 1) The booklets were prepared of such a size as would provide ample space for proper arrangement of the types.
- 2) The cover page of the test was solely reserved for directions and personal information about the pupils.
- 3) Score box was provided on the cover page.
- 4) Each test began on a fresh page .
- 5) All the necessary modifications and omissions in instructions and items were carried out.

In all five hundred copies of each of the 18 tests were printed.

They are given in Appendix.



C H A P T E R    IVPILOT TESTING

After the gross deficiencies in the tryout forms had been eliminated and directions and items modified on the basis of data collected in the pre-tryout, it was essential to obtain accurate information regarding the performance of each and every item in a sample of examinees that would coincide with the population about which the information was sought for. So the finished test was administered with a view to knowing how the test would work in its actual use.

The main objects<sup>1</sup> of pilot test are :

1. To identify weak or defective items and to reveal needed improvement.
2. To determine the discriminating power of each individual item.
3. To provide data needed to determine appropriate time limits for the finished test.
4. To identify non-functioning or implausible - distractors in multiple-choice items.
5. To determine the number of items in the test.
6. To determine the difficulty of each individual item to facilitate selection of items.
7. To determine the needed improvements in the process of administering the test.

Sampling :

The data collected in the pilot testing would be helpful to determine the quality and nature of the test items with respect to the population on which the norms were to be fixed later on. The sample used for pilot testing should naturally coincide with the sample of the ultimate population. These 18 tests were administered in three schools in the city and suburbs of Bombay, which would be considered to fairly represent the whole city. Each test was administered to 370 students studying in standards V, VI and VII.

<sup>1</sup>. Lindquist E.F. Editor "Educational Measurement" American Council on Education, Washington D.C. 1955. P.250-251.



Administration :

The tests were administered either in the months of March and April or in June and July. A standard procedure was fixed in the beginning for able administration of the Pilot Tests.

Before the test booklets were distributed, the students were addressed as follows for proper motivation.

" To-day, you are going to have a new type of test. The purpose of this test is to tell us something about the general educational development. We want to know your attainment in different subjects. The information will help us to know the standard of the school as a whole and will show how it compares with other high schools in the city. Over and above what we learn about you, it will help us to know your individual needs too. The results can be useful to all of us only if each of you put in best efforts in the tests. When you will see the tests, you will really enjoy them. They are so interesting."

Thus, after proper motivations, the following instructions were given :

" I shall now pass on the test-booklets. Do not open them. As soon as you get the booklet, fill in your name and other informations on the cover page. Also read the directions which are given on the cover page. Do not open the booklet until you are told to do so!"

Then the booklets were distributed to all the students. Sufficient time was allowed to fill in the necessary information and to read the instructions. They were asked to put question - regarding the tests. All the doubts of the pupils were cleared.

Then, the following instructions were given.

" When I say 'begin' turn the page and begin to write down. There are different sub-tests, in the



booklet. Complete directions with illustrations are given for each sub-test. Work as fast as you can. Sufficient time will be given to you provided you do not waste your time. As soon as you finish all the sub-tests, raise your finger."

Then the students were asked to begin.

This standard procedure was used by all the Research Assistants for all the 18 tests in the three standards.

The following schools were selected at random for Pilot testing. They were selected from different areas of the city. They included both Municipal Primary Schools as well as Secondary Schools, and also the number of students.

T A B L E 78

Name of the School.	Locality.	No. of students.
1. Andheri Park Municipal School.	Lamington Road	370 for each test.
2. Valibai Municipal School	Marine Lines	" "
3. Poibavdi Municipal School	Poibavdi	" "
4. Bhuleswar Municipal School	Bhuleswar	" "
5. Bazar gate High School	Fort	" "
6. Santa Cruz Muni. School	Santa Cruz	" "
7. G.T. Dvys' High School,	Kalbadevi	" "
8. Sardar Patel High School	Kandivali	" "
9. Modern High School	Sicca Nagar, Girgaum	" "
10. Girls' High School.	Andheri	" "
11. Jamnadas Adukia Balika Vidyalyaya.	Kandivali	" "
12. Chanda Ramji Girls School	F.C.P. Tank	" "
13. Kabibai High School	Fort	" "
14. Esplanade High School	Fort	" "
15. G.T. Girls High School	Gowalia Tank	" "



Scoring :

There are two important factors which require proper attention to decide the procedure of scoring. These factors are :

- 1) Weighting (2) Correction for guessing

1) Weighting :

In school subjects there are several topics which are more important than the others. More attention may be paid to topics both in teaching and testing. Moreover, the items vary greatly in difficulty and validity. Naturally such items demand more weightage in achievement tests. So, it will be advisable to allot weight to different items.

When different weights are allotted to items the scoring work becomes complicated, labourious and slow. Ross suggests "The scoring procedure adopted should be fairly simple. As a rule, the best procedure in scoring objective tests is to give one point of credit for each correct response. .... It is unnecessary to weight the items according to estimated difficulty or importance. .... Almost all pupils will be in the same rank order regardless of the weighting of the individual items." <sup>2</sup>

There is a good evidence of research works which were carried out by Douglass and Spencer, Petthoff and Barnett and other investigators. They have established the fact that "the correlations between weighted and unweighted scores on objective tests tend to be very high." <sup>3</sup> The correlations between weighted and unweighted scoring were approximately .97 to .99 in most of the experiments. According to Petthoff and Barnett, "the difference between weighted and unweighted

scoring may be considered to be so small that it may be

2. ... "Measurement in To-day's Schools"

Prentice-Hall, Inc. 1956. P. 156

3. Lindquist E.F., "Educational Measurement" American Council on Education, Washington D.C. 1955. P.370



disregarded, and a great deal of labour may be dispensed with by using the unweighted scores in determining the little grades."<sup>4</sup> Stalanker Substantiates the fact thus : the relationship between weighted and unweighted scores is so high, so nearly perfect that there is little justification for the use of weights with these examinations.<sup>5</sup>

In the present experiment, considering the above views no weightage to items was allotted. One point was given for each correct response of the item.

## 2) Correction for guessing :

In recognition type-tests, pupils have to select a response from the suggested responses. So, there are possibilities of guessing in the true-false tests, the multiple - choice tests and the matching test. Therefore, it should be decided whether the scores are to be obtained by adding the responses or whether a formula to correct for guessing and chance factors is to be employed. The formula for correcting for guessing is

$$S = R - \frac{W}{O - 1}$$

where S = Score

R = the number of right responses.

W = the number of wrong responses.

O = the number of options for a single item.

As there are two options in true-false tests, the formula assumes the form  $S = R - W$ . For three option item of multiple choice tests, the formula is  $S = R - W$ . For four option item, the formula is  $S = R - 1/3 W$ , and so on.

4. Ibid P. 370

5 Ibid P. 370



For the true-false tests, the formula  $S = R - W$  minimises the errors due to guessing. But the correction formula becomes meaningful only for 75 or 100 items. So Menzel<sup>6</sup> warns that there should be atleast 100 items in the test to eliminate the unreliability arising from mere chance and guess work. He further supports the fact, "It can be assumed that in the long run about half will guessed right and half wrong. The longer the test the more certain we may be that the above assumption is correct. For, the law of averages, applies to a large number of trials and is not at all reliable in a small number of trials."<sup>7</sup>

For multiple-choice tests, Ross<sup>8</sup> suggests that it is desirable to have items with the same number of choices, whether the correction formula is to be applied.

For matching tests, Lindquist<sup>9</sup> is not in favour of correction formula. Ross substantiates the fact, "if the items have six or more options, it is probably not worth while to correct the 'rights' score for chance."<sup>10</sup>

In general, Micheal and Karnes opine, "There does not seem to be much evidence to indicate that the informal type test is significantly improved by correcting for guessing . . . The authors are of the opinion that little is to be gained in using correction formula."<sup>11</sup>

In the present experiment, considering (1) the number of items in true-false tests, (2) unequal number of options for items of multiple-choice tests and (3) the views of the above research workers, no correction formula is applied for scoring.

6 Menzel E.W. "Suggestions for the use of New Type Tests in India" Oxford University Press 1952 P.6

7 Ibid P.6

8 Ross C.C., "Measurement in To-day's schools" Prentice-Hall Inc. P.186.

9 Lindquist E.F., "Educational Measurement," American Council on Education, Washington D.C. 1955 P.367

10 Ross C.C., "Measurement in To-day's schools" Prentice-Hall Inc. 1955. P.157

11. Micheal W.J. and Karnes, "Measuring Educational Achievement" McGraw - Hill Book Co. Inc. New York 1950. P.148



Examining and Arranging the Test-booklets :

All the 370 booklets of each standard were examined giving one point for every correct response.

These booklets were arranged in descending order of score, i.e. one with the highest score on the top and one with the lowest score at the bottom. These booklets were then numbered from 1 to 370.

The selection of items for the final run is based partly on detailed specification of the content and partly on statistical characteristic of each item. There are two main statistical aspects of the individual item. (1) the difficulty level (2) the discriminating power.

Kelley<sup>12</sup> has shown that the most accurate determination of item validities or internal consistencies can be obtained by comparing approximately the upper and lower 27 percent of the total group.

For such statistical purposes, the test-booklets were divided into three groups :

- 1) The upper group (called U)  
- 27% booklets i.e. 100 booklets, 1 to 100
- 2) The middle group (called M)  
- 46 % booklets i.e. 170 booklets 101 to 270
- 3) The lower group (called L)  
- 27% booklets i.e. 100 booklets 271 to 370.

Evidently the U group represents good students while the L group represents weak students.

The percentage of students in each group answering each item correctly was calculated. As there were 100 students in "U" and "L" groups. The number of students answering each item correctly gave the percentage directly.

<sup>12</sup> Kelley T.L., "The Selection of Upper and Lower Groups for the Validation of Test Item," J.Edu. Psychol., 30, 17-24 (1939). Quoted by Thorndike R.L., "Personnel selection," John Wiley & Sons Inc. Newyork. 1949 P.345



i) The difficulty Value :

There are different methods to compute the item difficulty indices. The most popular one is based on the extreme scores of the distribution.

The following formula is generally used to find the difficulty values.

$$D = 100 - \frac{U + L}{2}$$

where D is the Difficulty value

U is the percentage of students scoring the item correctly in the upper group.

L is the percentage of students scoring the item correctly in the lower group.

In this experiment, this very method was used for all the 18 tests. In the above method, middle 46 % test-booklets were not taken into consideration. Naturally, it will raise some doubts about the reliability of the method. There is an experimental evidence. "The writer has computed the reliability co-efficient of group of typical item difficulty indices estimated in this way. It was found to be .98 when the sample included 100 examinees in the highest 27 percent and 100 examinees in the lowest 27 percent."<sup>13</sup>

In the present experiment, 370 cases were taken for pilot testing. 27% of 370 cases give 100 cases for the upper and lower groups.

Validity and Discriminating Power of the Items :

Items must be able to discriminate the achievements of various pupils. K. Bean defines the discriminating value of an item as "the degree to which any single item separates the superior individuals from the inferior ones in the trait being measured."<sup>13</sup> There are several methods of determining the discriminating Powers of an item. The following methods are used in the present project.

<sup>13</sup> Bean K. L. "Construction of Educational and Personal Tests" McGraw Hill Book Company, New York 1963 P. 153.



i) First Method :

The reliability of the discriminating power of each item was also determined by the use of the formula  $V = U-L$ .

Naturally, if an item is discriminative the batch of the brighter students (i.e. U group) will correctly solve that item more frequently than the batch of the weaker students - (i.e. L group). If an item is not discriminative, the batch of brighter and weaker students will correctly solve that item approximately in equal proportions. It also happens that L group pupils correctly solve the item more frequently than the U group pupils, in the case of negative discriminative items.

ii) Use Flanagan's Tables

Flanagan<sup>15</sup> has prepared a table for estimating product moment correlations. In this method the discriminating value of each item is calculated by finding the percentage of correct responses of each item in the upper and lower groups and reading the value directly from these tables. These tables were used for determining reliability of the discriminating value of the item in the present experiment.

iii) Use of Nomograph to assign discriminating value to Test Item :

Lowshe has developed a nomograph that can be used to assign discriminating values to individual test items. This nomograph has been used for this purpose in the present experiment.

The following tables show all these values of all the 18 tests of the present experiment.

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15 Thorndike R.L. Personal Selection Test and Measurement Technique" John Wiley & Sons; Inc. 1949; P.345



Tables showing U., L., and the Difficulty, Values, validity and Discriminating power of the items by the different methods used in the Experiment.

TABLE 79

## Standard VII

## Subject: Gujarati

Sub- Test No.	Item No.	Upper U %	Lower L %	Difficulty Value $100 - \frac{U + L}{2}$	Validity V = U-L	Discriminating Value		
						Flanagan's Tables	No. 7	gra- 8
I	1	98	68	17.0	30	0.56	1.70	
	2	98	60	21.0	38	0.62	1.90	
	3	98	57	22.5	41	0.64	1.90	
	4	94	58	24.0	36	0.50	1.40	
	5	96	55	24.5	41	0.58	1.70	
	6	91	43	33.0	48	0.55	1.60	
	7	89	45	33.0	44	0.50	1.40	
	8	86	45	34.5	41	0.46	1.50	
	9	88	43	34.5	45	0.50	1.40	
	10	89	41	35.0	48	0.53	1.50	
	11	84	44	36.0	40	0.44	1.20	
	12	79	48	36.5	31	0.34	0.90	
	13	86	40	37.0	46	0.50	1.40	
	14	77	41	41.0	36	0.38	1.00	
	15	81	21	49.0	60	0.60	1.70	
	16	71	31	49.0	40	0.40	1.10	
	17	62	36	50.5	26	0.27	0.70	
	18	63	35	50.5	25	0.28	0.70	
	19	66	31	51.5	35	0.36	0.90	
	20	70	26	52.0	37	0.38	0.70	
	21	62	34	52.0	28	0.29	0.70	
	22	71	24	52.5	47	0.47	0.90	
	23	70	24	53.0	46	0.46	1.30	
	24	64	27	54.5	37	0.38	1.00	
	25	68	22	55.0	46	0.47	1.30	
	26	63	26	55.5	37	0.38	0.70	



I.	2	3	4	5	6	7	8
	27	63	24	56.5	39	0.40	1.10
	28	56	27	58.5	29	0.31	0.85
	29	59	25	58.0	34	0.35	0.95
	30	51	27	61.0	24	0.26	0.70
	31	56	18	63.0	38	0.41	1.10
	32	49	22	64.5	27	0.30	0.80
	33	44	1.0	69.0	26	0.30	0.55
	34	42	17	70.5	25	0.30	0.80
	35	45	0	77.5	45	0.10	0.90
	36	33	11	79.0	42	0.12	1.18
	37	30	12	79.0	18	0.15	0.65
	38	37	4	80.00	33	0.52	0.91
	39	33	2	83.0	31	0.57	1.02
	40	19	4	89.0	15	0.35	0.59
II	1	99	89	5.0	10	0.45	1.05
	2	99	84	8.5	15	0.49	1.45
	3	97	77	13.0	20	0.44	1.25
	4	96	77	13.5	19	0.39	1.10
	5	96	71	16.5	25	0.45	1.30
	6	91	72	18.5	19	0.30	0.80
	7	88	72	20.0	16	0.24	0.60
	8	89	55	28.0	34	0.42	1.20
	9	65	30	52.5	35	0.36	0.95
	10	66	37	58.5	29	0.30	0.80
	11	21	5	87.0	16	0.34	0.85
	12	17	1	91.0	16	0.50	0.89
III	1	100	66	17.0	34	0.55	1.06
	2	89	72	19.5	17	0.26	0.70
	3	93	66	20.5	17	0.41	0.65
	4	90	64	23.0	26	0.36	1.00



	1	2	3	4	5	6	7	8
I	5	83	65	23.5	23	0.31	0.90	
	6	85	62	26.5	23	0.30	0.80	
	7	88	58	27.0	30	0.38	1.10	
	8	92	53	28.0	39	0.50	0.51	
	9	87	54	29.5	33	0.40	1.10	
	10	85	50	32.5	35	0.41	1.10	
	11	85	51	32.0	34	0.40	1.75	
	12	76	51	36.5	25	0.27	0.75	
	13	80	42	39.0	38	0.40	1.10	
	14	80	42	39.0	38	0.40	1.10	
	15	73	46	40.5	27	0.29	0.75	
	16	74	44	41.0	30	0.32	0.85	
	17	72	43	42.5	29	0.30	0.80	
	18	70	41	44.5	29	0.30	0.80	
IV	1	56	64	25.0	22	0.29	0.80	
	2	83	52	27.5	31	0.36	0.95	
	3	77	57	33.0	20	0.23	0.60	
	4	75	44	40.5	31	0.33	0.90	
	5	63	33	52.0	30	0.31	0.75	
	6	65	29	53.0	36	0.37	1.00	
	7	58	32	55.0	26	0.27	0.70	
	8	54	29	58.5	25	0.26	0.70	
	9	51	20	64.5	31	0.34	0.90	
	10	71	53	38.0	28	0.19	0.50	
V	1	98	84	9.0	14	0.40	0.71	
	2	97	80	17.0	12	0.41	0.31	
	3	98	69	16.5	19	0.56	1.63	
	4	97	66	18.5	31	0.54	1.50	
	5	96	59	22.5	37	0.55	1.60	
	6	95	59	23.5	36	0.52	1.50	
	7	95	45	30.5	50	0.62	1.90	



	1	2	3	4	5	6	7	8
	8	83	53		32.0	30	0.35	0.90
	9	81	53	-	33.0	28	0.32	0.45
	10	72	42		43.0	30	0.31	0.85
	11	49	18		46.5	31	0.35	0.95
	12	72	30		49.0	42	0.42	1.10
VI	1	91	66		21.5	25	0.36	1.10
	2	67	29		52.0	38	0.39	1.25
	3	46	9		72.5	37	0.47	1.30
	4	49	18		66.5	31	0.35	0.90
	5	67	23		55.0	44	0.45	1.25
	6	34	4		81.0	30	0.49	1.40
	7	71	39		45.0	32	0.33	0.90
	8	61	38		50.5	23	0.24	0.60
	9	53	37		55.0	16	0.16	0.45
	10	59	25		58.0	34	0.35	0.95
	11	65	24		55.5	41	0.42	1.18
	12	66	29		52.5	37	0.38	1.00
	13	48	10		71.0	38	0.47	1.275
	14	5	11		92.0	6	0.17	0.4
	15	13	7		90.0	6	0.14	0.3
	16	62	24		57.0	38	0.39	1.75
	17	67	30		51.5	37	0.375	1.0
	18	48	15		68.5	33	0.385	1.0
	19	55	30		57.5	25	0.26	0.7
	20	49	16		62.5	33	0.38	1.0
	21	53	16		65.5	37	0.41	1.1
	22	45	21		67.0	24	0.27	0.7
	23	36	10		77.0	26	0.36	0.95
	24	39	11		75.0	28	0.37	0.975
	25	59	13		64.0	46	0.50	1.4



	1	2	3	4	5	6	7	8
VII	1	78	34	44	44	.45	0.73	
	2	80	19	50.5	61	.605	1.775	
	3	71	24	53	47	.47	0.90	
	4	82	36	41.0	46	.48	1.35	
	5	63	31	53	32	.30	0.61	
	6	67	26	53.5	41	.415	1.15	
	7	57	20	61.5	37	.395	1.75	
	8	49	27	62	22	.23	0.29	
	9	67	9	62	58	.0.62	1.10	
	10	49	26	62.5	23	.25	0.675	
	11	55	19	63	37	0.40	0.61	
	12	39	15	73	24	0.31	0.87	
	13	35	2	83	31	0.57	1.02	
VIII	1	95	66	21	17	0.41	0.65	
	2	63	18	59	46	0.48	1.01	
	3	53	8	67	50	0.58	0.95	
	4	88	10	51	78	0.76	0.50	
	5	42	9	75	33	0.43	0.90	
	6	50	2	74	48	0.68	1.10	
	7	77	9	57	68	0.68	1.32	
	8	51	8	71	43	0.58	0.90	
	9	63	10	64	53	0.58	0.95	
	10	68	5	64	63	0.69	1.40	
	11	37	4	80	33	0.52	0.91	
	12	44	11	73	33	0.41	0.89	
	13	54	12	67	42	0.48	1.12	
IX	1	94	67	19.5	27	.43	1.2	
	2	87	67	23.0	20	.275	0.725	
	3	90	61	24.5	29	.39	1.5	
	4	83	58	29.5	25	.295	0.8	
	5	81	47	36.0	34	.39	1.0	



1	2	3	4	5	6	7	8
6	72	49	39.5	23	.245	0.65	
7	79	38	41.5	41	.43	1.175	
8	75	26	49.5	49	.49	1.4	
9	62	19	59.5	43	.455	1.2	
10	10	3	93.5	7	.24	0.6	

T A B L E 80

Standard: VIII		Subject: Hindi					
Sub-Test No.	Item No.	Upper U %	Lower L %	Difficulty value 100-U-L $\frac{U+L}{2}$	Validity V-U-L	Reliability R	Discrimination
I	1	60	41	49.5	19	.20	0.55
	2	98	86	8	12	.37	1.1
	3	94	79	13.5	15	.30	0.85
	4	91	61	24.0	30	.41	1.125
	5	85	66	24.5	19	.25	0.7
	6	78	55	33.5	23	.26	0.7
	7	73	42	42.5	31	.33	0.875
	8	54	25	60.5	29	.31	0.85
	9	46	16	69.0	30	.35	0.95
II	1	97	78	12.5	19	.43	1.2
	2	94	63	21.5	31	.46	1.3
	3	97	65	19.0	32	.54	1.6
	4	87	52	30.5	35	.415	1.15
	5	85	38	38.5	47	.50	1.4
	6	99	73	14.0	26	.60	1.8
	7	97	53	25.0	44	.63	1.9
	8	96	53	25.5	43	.59	1.725
	9	86	46	34.0	40	.45	1.225



	2	3	4	5	6	7	8
	10	95	49	28.0	46	.59	1.725
I	1	97	75	14.0	22	.46	1.3
	2	90	60	25.0	30	.40	1.5
	3	92	48	30.0	44	.53	1.55
	4	92	46	31.0	46	.55	1.6
	5	87	47	33.0	40	.455	1.3
	6	91	41	34.0	50	.57	1.65
	7	83	46	35.5	37	.405	1.125
	8	89	35	38.0	54	.58	1.7
	9	79	41	40.0	38	.40	1.1
	10	70	33	48.5	37	.375	1.0
	11	74	21	52.5	53	.53	1.55
	12	65	25	55.0	40	.41	1.1
	13	56	33	55.5	23	.24	0.65
	14	63	20	58.5	43	.45	1.2
	15	48	17	67.5	31	.355	0.975
	16	50	13	68.5	37	.435	1.175
	17	38	14	74.0	24	.31	0.8
	18	48	2	75.0	46	.67	2.0
	19	30	3	83.5	27	.505	1.4
	20	31	2	83.5	29	.555	1.6
V	1	98	91	5.5	7	.275	0.8
	2	95	76	14.5	19	.365	1.0
	3	91	67	21.0	24	.355	0.95
	4	92	60	24.0	32	.44	1.2
	5	90	59	25.5	31	.405	1.1
	6	85	55	30.0	30	.355	0.95
	7	86	51	31.5	35	.41	1.1
	8	86	45	34.5	41	.46	1.3
	9	78	52	34.5	26	.29	0.8
	10	63	40	48.5	23	.235	0.6



	2	3	4	5	6	7	8
11	79	49	36.0	30	.33	0.9	
12	76	49	37.5	27	.29	0.8	
13	76	46	39.0	30	.32	0.875	
14	76	43	40.5	33	.35	0.95	
15	77	41	41.0	36	.38	1.0	
16	72	45	41.5	27	.28	0.75	
17	71	45	42.0	26	.27	0.7	
18	68	45	43.5	23	.24	0.65	
19	75	38	43.5	37	.38	1.5	
20	69	42	44.5	27	.28	0.75	
21	74	34	46.0	40	.41	1.15	
22	62	33	52.5	29	.30	0.8	
23	55	24	60.5	31	.33	0.9	
24	43	21	68.0	22	.25	0.65	
25	46	17	61.5	29	.345	0.9	
1	35	7	79.0	28	.41	1.15	
2	41	12	73.5	29	.37	0.975	
3	50	27	61.5	23	.245	0.65	
4	27	13	80.0	14	.21	0.55	
5	19	4	89.0	15	.35	0.12	
6	50	11	69.5	39	.465	1.25	
7	79	10	55.5	69	.69	2.15	
8	75	24	50.5	51	.51	1.45	
9	74	20	53.0	54	.54	1.55	
10	30	15	77.5	15	.205	0.55	
11	47	12	70.5	35	.42	1.15	
12	44	16	70.0	28	.33	0.9	
13	55	12	61.5	43	.485	1.475	
14	72	22	53.0	50	.50	1.45	
15	18	7	87.5	11	.23	0.55	
16	60	14	63.0	46	.50	1.4	



2	3	4	5	6	7	8
17	24	9	83.5	15	.255	0.65
18	47	7	73.0	40	.52	1.45
19	60	15	62.5	45	.485	1.35
20	30	5	82.5	25	.43	1.15
1	99	96	2.5	3	.23	0.39
2	90	71	20.0	19	.29	0.55
3	88	46	23.0	22	.30	0.56
4	80	59	31.0	21	.25	0.42
5	87	44	35.0	43	.48	0.82
6	87	35	39.0	52	.55	0.80
7	78	35	44.0	43	.44	0.85
8	65	45	45.0	20	.21	0.49
9	60	46	47.0	14	.14	0.44
10	65	38	49.0	27	.28	0.51
11	71	24	53.0	47	.47	0.90
12	65	23	54.0	38	.39	0.25
13	63	26	56.0	37	.38	0.71
14	75	10	58.0	65	.66	1.45
15	56	19	63.0	37	.40	0.61
16	47	14	70.0	33	.39	0.58
17	46	8	73	38	.49	1.00
18	32	14	77	18	.25	0.15
19	39	4	79	35	.54	0.96
20	33	2	83	31	.57	1.02
21	9	3	94	6	.22	0.16
1	99	88	6.5	11	.43	1.2
2	99	74	13.5	25	.59	1.75
3	95	58	23.5	37	.53	1.5
4	92	56	26.0	36	.47	1.3
5	94	52	27.0	42	.55	1.6
6	97	41	31.0	56	.695	2.2



2	3	4	5	6	7	8
7	85	47	34.0	38	.425	1.2
6	83	48	34.5	35	.39	1.1
9	87	42	35.5	45	.495	1.4
10	85	39	38.0	46	.49	1.4
11	73	46	40.5	27	.285	0.75
12	75	42	41.5	33	.345	0.95
13	75	36	44.5	39	.40	1.1
14	83	28	44.5	55	.555	1.6
15	65	42	46.5	23	.26	0.65
16	80	27	46.5	53	.53	1.55
17	66	39	47.5	27	.28	0.75
18	70	20	54.0	48	.49	1.375
19	66	24	55.0	42	.43	1.2
20	72	18	55.0	54	.54	1.55
21	62	27	55.5	35	.36	0.975
22	68	18	57.0	50	.51	1.45
23	21	5	87.0	16	.33	0.85
24	95	56	24.5	39	.55	1.6
25	75	34	45.5	41	.42	1.1
26	65	27	54.0	38	.39	1.5
27	46	8	73.0	38	0.49	1.0
28	32	14	77.0	18	0.25	0.15
29	39	4	78.5	35	.535	1.25
30	23	3	87.0	20	.44	1.15
31	27	3	85.0	24	.475	1.325
32	14	3	91.5	11	.315	0.85
33	10	3	93.5	7	.245	0.6



TABLE 81

Sub: Arithmetic Std. : VII

Sub-Test No.	Item No.	Upper U %	Lower L %	Difficulty value 100-U+L 2	Vali- dity V-U-L	Relia- bility R	Discrimi- nation
1	2	3	4	5	6	7	8
I	1	67	39	47.0	28	.29	0.75
	2	66	38	48.0	28	.29	0.75
	3	60	32	54.0	28	.29	0.75
	4	58	31	55.5	27	.28	0.75
	5	11	0	95.0	11	0.41	0.86
	6	5	1	97.0	4	.265	0.65
	7	5	0	98.0	5	0.27	0.35
II	1	89	66	22.5	23	.34	0.9
	2	72	15	56.5	57	.58	1.65
	3	53	4	71.5	49	.625	1.85
	4	39	11	75.0	28	.37	0.95
	5	37	11	76.0	26	.35	0.9
	6	31	3	83.0	28	.51	1.4
	7	8	1	95.5	7	.35	0.9
	8	5	1	97.0	4	.265	0.65
	9	6	1	96.5	5	.30	0.8
III	1	71	52	39.0	19	.21	0.28
	2	70	31	49.5	39	.39	1.05
	3	54	16	65.0	38	.42	1.15
	4	54	12	67.0	42	.48	1.35
	5	40	11	74.5	29	.38	1.0
	6	23	8	84.5	15	.265	0.7
IV	1	65	8	63.5	57	.62	1.85
	2	62	4	67.0	58	.68	2.1
	3	50	3	73.5	47	.648	1.95
	4	54	10	68.0	44	.51	1.45
	5	47	5	74.0	42	.565	1.6
	6	58	16	63.0	42	.45	1.25
IV/10	7	45	9	73.0	36	.46	1.25



	1	2	3	4	5	6	7	8
V	1	73	16	55.5	57	.575	1.65	
	2	61	6	66.5	55	.63	1.9	
	3	53	1	73.0	52	.735	2.45	
	4	19	1	90.0	18	.52	1.5	
	5	38	1	80.5	37	.67	2.05	
	6	80	44	38.0	36	.39	1.05	
	7	64	11	62.5	63	.565	1.65	
	8	39	1	80.0	38	.675	2.1	
	9	74	29	48.5	45	.45	1.25	
	10	48	7	72.5	45	.535	1.5	
	11	30	3	83.5	27	.495	1.4	
	12	39	3	79.0	36	.575	1.65	
	13	35	1	82.0	34	.655	1.95	
VI	1	73	19	54.0	54	.54	1.55	
	2	51	25	62.0	26	.28	0.75	
	3	51	23	63.0	28	.305	0.8	
	4	38	12	75.0	26	.34	0.9	
	5	35	8	78.5	27	.39	1.05	
	6	30	13	78.5	17	.24	0.6	
VII	1	92	34	37.0	58	.63	1.9	
	2	91	23	43.0	68	.685	2.1	
	3	84	12	52.0	72	.70	2.25	
	4	94	28	39.0	66	.70	2.25	
	5	92	27	40.5	65	.67	2.05	
	6	88	23	44.5	65	.65	2.0	
	7	91	24	42.5	67	.68	2.05	
	8	90	20	45.0	70	.70	2.15	
	9	69	10	60.5	59	.62	1.85	
	10	27	3	85.0	24	.475	1.3	
	11	15	0	92.5	15	0	1.4	
	12	92	24	42.0	68	.69	2.2	
	13	82	24	47.0	58	.58	1.7	



1	2	3	4	5	6	7	8
14	14	82	4240	470	.58	.58	1.7
15	15	55	1	72.0	54	.745	2.5
16	16	53	1	73.0	52	.735	2.45
17	17	19	1	90.0	18	.52	1.5

TABLE 82

Standard VII

Subject: History

Sub Test No.	Item No.	Upper U %	Lower L %	Difficulty value 100-U+L 2	Vali- dity V-U-L	Relia- bility V-U-L	Discrimi- nation
1	2	3	4	5	6	7	8
I	1	99	85	8.0	14	.475	1.4
	2	94	81	12.0	13	.275	0.75
	3	91	83	13.0	8	.155	0.45
	4	94	80	13.0	14	.29	0.75
	5	99	59	21.0	40	.685	2.2
	6	91	64	22.5	27	.38	1.05
	7	81	74	22.5	7	.095	0.3
	8	95	58	23.5	33	.53	1.55
	9	84	66	25.0	18	.24	0.65
	10	75	71	27.0	4	.05	0.15
	11	91	55	27.0	36	.455	1.25
	12	88	54	29.0	34	.41	1.15
	13	92	46	31.0	46	.55	1.6
	14	78	49	36.5	29	.32	1.35
	15	91	36	36.5	55	.595	1.65
	16	73	53	37.0	20	.21	0.6
	17	70	56	37.0	14	.15	0.45
	18	68	52	40.0	16	.17	0.45
	19	78	38	42.0	40	.42	1.15
	20	63	51	43.0	12	.13	0.35
	21	67	45	44.0	22	.23	0.6



I	2	3	4	5	6	7	8
	22	64	46	45.0	22.	.19	0.5
	23	60	44	48.0	24	.16	0.45
	24	66	35	49.5	31	.32	0.85
	25	60	40	50.0	20	.21	0.55
	26	71	21	54.0	50	.505	1.45
	27	55	40	52.5	15	.15	0.45
	28	57	38	52.5	19	.19	0.55
	29	58	36	53.0	22	.22	0.6
	30	56	38	53.0	18	.18	0.5
	31	63	30	53.5	33	.34	0.09
	32	58	34	54.0	24	.25	0.6
	33	52	32	58.0	20	.21	0.55
	34	54	30	58.0	24	.25	0.65
	35	53	27	60.0	26	.28	0.75
	36	53	25	61.0	28	.30	0.8
	37	58	15	63.5	43	.465	1.3
	38	57	16	64.0	41	0.45	0.70
	39	38	19	71.5	19	0.235	0.6
	40	16	14	85.0	2	0.03	0.1
II	1	95	58	23.5	37	0.53	1.55
	2	81	19	50.0	62	0.615	1.75
	3	70	21	55.0	49	0.50	0.94
	4	74	7	59.5	67	0.695	2.15
	5	60	11	64.5	49	0.54	1.55
	6	42	17	70.5	25	0.295	0.8
	7	53	5	71.0	48	0.60	1.75
	8	42	1	78.5	41	0.69	2.15
	9	34	1	82.5	33	0.65	1.95
	10	20	1	89.5	19	0.53	1.5
	11	17	2	90.5	15	0.415	1.1
	12	14	4	91.0	10	0.26	0.65
	13	16	1	91.5	15	0.49	1.35



	2	3	4	5	6	7	8
14	15	1	92.0	14	.475	1.3	
15	13	1	93.0	12	.445	1.2	
16	4	1	97.5	3	.23	0.55	
17	2	91	76	16.5	15	.255	0.7
18		84	66	25.0	18	.24	0.65
19		98	43	29.5	55	.715	2.3
20		93	54	26.5	39	.51	1.45
21		79	57	32.0	22	.25	0.75
22		72	41	43.5	31	.32	0.85
23		64	44	45.0	20	.21	0.55
24		67	41	46.0	26	.27	0.7
25		65	41	47.0	24	.25	0.65
26		74	31	47.5	43	.43	1.2
27		79	25	48.0	54	.54	1.55
28		70	33	48.5	43	.375	1.0
29		86	36	39.0	50	.53	1.5
30		51	22	63.5	29	.32	0.85
31		41	2	78.5	39	.625	1.9
32		44	9	73.5	35	.45	1.2
33		70	25	53	45	.45	0.65
34		64	27	54.5	37	.38	1.0
35		71	18	55.5	53	.535	1.5
36		70	11	59.5	59	.615	1.8
37		44	31	62.5	13	.14	0.4
38		52	10	69.0	42	.50	1.4
39		31	30	69.5	1	.01	0.05
40		50	10	70.0	40	.48	1.3
41		41	19	70.0	22	.265	0.7
42		35	19	73.0	16	.20	0.5
43		37	13	75.0	24	.31	0.50
44		7	1	96.0	6	.325	0.3



		1	2	3	4	5	6	7	8
IV	1	97	76	1345	21	•45	1.25		
	2	93	57	25.0	36	•475	1.4		
	3	95	54	25.5	41	•555	1.6		
	4	89	39	36.0	50	•545	1.6		
	5	85	36	39.5	49	•515	1.5		
	6	96	22	41.0	74	•76	2.6		
	7	93	18	44.5	75	•745	2.45		
	8	92	14	47.0	78	•76	2.55		
	9	88	9	51.5	79	•765	2.5		
	10	48	4	74.0	44	•60	1.7		
	11	87	10	51.5	77	•75	2.45		
	12	72	18	55.0	54	•54	1.55		
	13	79	7	57.0	72	•72	2.25		
	14	70	11	59.5	59	•615	1.8		
	15	72	9	59.5	63	•65	1.95		
	16	61	10	64.5	51	•565	1.6		
	17	59	3	69.0	56	•705	2.1		
	18	50	10	70.0	40	•48	0.75		
	19	27	3	85.0	24	•49	1.3		
	20	25	5	85.0	20	•385	1.0		
	21	13	2	92.5	11	•355	0.75		
V	1	67	31	51.0	36	•365	0.95		
	2	63	32	52.5	31	•32	0.85		
	3	66	29	52.5	37	•38	1.0		
	4	69	23	54.0	46	•47	1.3		
	5	52	30	59.0	22	•23	0.6		
	6	57	21	61.0	36	•385	1.0		
	7	61	14	62.5	47	•505	1.45		
	8	48	22	65.0	26	•29	0.7		
	9	41	28	65.5	13	•14	0.4		
	10	39	27	67.0	12	•135	0.4		
	11	45	18	68.5	27	•31	0.85		



1	2	3	4	5	6	7	8
II	12	38	19	71.5	19	.235	0.6
	13	28	17	77.5	11	.15	0.4
	14	26	19	77.5	7	.095	0.2
VI	1	88	44	34.0	44	.49	1.4
	2	65	26	54.5	39	.40	1.1
	3	62	24	56.5	38	.39	1.05
	4	54	31	57.5	23	.24	0.65
	5	56	25	59.5	31	.33	0.9
	6	54	18	64.0	36	.39	1.05
	7	59	12	64.5	47	.515	1.45
	8	37	26	68.5	11	.13	0.35
	9	34	27	69.5	7	.105	0.2
	10	36	21	71.5	15	.18	0.5
	11	36	10	77.0	26	.36	0.95
	12	27	15	79.0	12	.175	0.45
	13	32	9	79.5	23	.345	0.9
	14	27	12	80.5	15	.225	0.6
	15	24	12	82.0	12	.19	0.45
VII	1	65	23	56	42	.44	0.91
	2	53	34	56.5	19	.20	0.55
	3	48	28	62.0	20	.21	0.55
	4	26	14	80.0	12	.18	0.45
	5	37	7	78.0	30	.43	0.85
	6	27	17	78.0	10	.14	0.4
	7	30	17	76.0	13	.175	0.45
	8	60	35	52.5	25	.26	0.7
	9	39	5	78.0	34	.50	0.98
VIII	1	45	29	63.0	16	.17	0.45
	2	48	21	65.5	27	.30	0.8
	3	40	18	71.0	22	.27	0.7



## 100

	2	3	4	5	6	7	8
1	34	23	71.5	11	.135	0.4	
2	34	21	72.5	13	.16	0.4	
3	30	22	74.0	8	.10	0.3	
4	26	24	75.0	2	.03	0.1	
5	28	20	76.0	8	.11	0.3	
6	20	19	80.5	1	.015	0.05	
7	20	16	82.0	4	.06	0.15	
8	26	10	82.0	16	.26	0.55	
9	16	11	86.5	5	.95	0.25	

TABLE 83

## Standard VII

Subject: Geography

Subj.	Iter. Test N. o.	Upper U %	Lower L %	Difficulty value $\frac{100 - U + L}{2}$	Vali- dity $V - U - L$	Relia- bility R	Discrimi- nation
1	1	98	85	8.5	13	.385	1.15
2	2	97	81	11.0	16	0.395	1.1
3	3	96	70	17.0	26	0.46	1.35
4	4	93	66	20.5	27	0.41	1.15
5	5	87	77	18.0	10	0.155	0.50
6	6	94	59	23.5	35	.49	1.45
7	7	88	63	24.5	25	.33	0.95
8	8	87	63	25.0	24	.315	0.85
9	9	92	57	25.5	35	.46	1.35
10	10	92	54	27.0	38	.49	1.4
11	11	85	61	27.0	24	.305	0.85
12	12	80	56	32.0	24	.27	0.75
13	13	88	47	33.0	41	.47	0.74
14	14	82	51	33.5	31	.35	0.95
15	15	82	48	35.0	34	.38	1.05
16	16	80	50	35.0	30	.33	0.90
17	17	82	45	36.5	37	.40	1.10



	3	4	5	6	7	8
1	72	49	39.5	23	.27	0.70
2	75	45	40.0	30	.32	0.90
3	72	44	42.0	28	.29	0.80
4	74	30	48.0	44	.44	1.25
5	67	35	49.0	32	.33	0.90
6	62	35	51.5	27	.28	0.75
7	74	25	51.0	49	.49	0.95
8	84	14	51.0	30	.68	1.62
9	75	24	51.0	51	0.51	1.00
10	86	11	52.0	75	0.73	1.50
11	75	20	53.0	55	0.55	1.44
12	63	30	54.0	33	0.34	0.55
13	65	23	56.0	42	0.44	0.92
14	65	24	56.0	41	0.42	1.09
15	72	15	57.0	57	0.59	1.20
16	56	26	59.0	30	0.32	0.49
17	59	21	60.0	38	0.40	0.51
18	57	16	64.0	41	0.45	0.70
19	45	24	66.0	21	0.25	0.31
20	46	13	71.0	33	0.40	0.70
21	15	2	92.0	13	0.38	0.42
22	17	1	92.0	16	0.50	0.89
23	97	89	7.0	8	.265	.9
24	94	73	16.5	21	.37	1.0
25	81	36	41.5	45	.47	1.35
26	72	44	42.0	28	.29	1.0
27	71	39	45.0	32	.33	0.90
28	75	28	48.5	47	.47	1.35
29	75	25	50.0	50	.50	1.45
30	63	34	51.5	29	.30	1.30
31	69	23	54.0	46	.465	1.30
32	69	40	55.5	29	.30	0.80



1	2	3	4	5	6	7	8
11		59	21	60.0	38	.40	1.10
12		70	8	61.0	62	.65	2.0
13		58	8	67.0	50	.58	1.7
14		59	1	70.0	58	.765	2.6
15		41	10	74.5	31	.405	1.1
16		32	18	75.0	14	.18	0.5
17		42	5	76.5	37	.53	1.5
18		36	2	81.0	34	.59	1.75
19		26	7	83.5	19	.33	0.9
20		23	5	86.0	18	.355	0.9
21		23	2	87.5	21	.49	1.40
22		23	1	88.0	22	.56	1.6
23		21	1	89.0	20	.54	1.6
24		93	80	13.5	13	.26	0.7
25		91	77	16.0	14	.25	0.62
26		88	46	23.0	22	.30	0.56
27		79	26	47.5	53	.53	1.55
28		69	27	52.0	42	.42	0.72
29		65	30	52.5	35	.36	0.95
30		71	24	53.0	47	.47	0.90
31		65	25	54.0	38	.39	0.25
32		72	20	54.0	52	.52	1.5
33		63	26	56.0	37	.38	0.71
34		63	24	57.0	39	.40	0.72
35		77	9	57.0	68	.68	1.32
36		65	19	58.0	46	.48	1.30
37		67	17	58.0	50	.51	1.00
38		64	18	59.0	46	.48	0.65
39		67	15	59.0	52	.54	0.92
40		59	21	60.0	38	.40	0.51
41		75	44	60.5	31	.33	0.9
42		64	10	63.0	54	.58	1.7
43		64	20	64.5	31	.34	0.90
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	2	3	4	5	6	7	8
21	48	4	74.0	44	.60	1.75	
22	39	7	77.0	32	.45	1.25	
23	36	5	79.0	31	.48	1.35	
24	31	5	82.0	26	.44	1.20	
25	31	4	82.5	27	.47	1.30	
26	31	2	83.5	29	.555	1.6	
27	21	6	86.5	15	.30	0.75	
28	20	6	87.0	14	.29	0.75	
29	21	2	88.5	19	.47	1.3	
30	12	6	91.0	6	.15	0.4	
1	98	91	5.5	7	.28	0.8	
2	95	80	12.5	15	.33	0.9	
3	79	42	39.5	37	.39	1.5	
4	77	25	49.0	52	.52	1.5	
5	62	36	51.0	26	.27	0.7	
6	65	30	52.5	35	.36	0.95	
7	50	20	65.0	30	.33	0.90	
8	40	18	70.5	22	.27	0.7	
9	36	15	74.5	21	.275	0.7	
10	41	8	75.5	33	.445	1.20	
11	16	4	90.5	12	.30	0.72	
1	79	35	43.0	44	.45	1.25	
2	79	36	43.0	43	.45	0.40	
3	66	47	44.0	19	.20	0.45	
4	72	39	45.0	33	.34	0.52	
5	80	24	48.0	56	.56	1.15	
6	72	13	57.5	59	.60	1.75	
7	51	13	68.0	38	.44	1.2	
8	42	9	74.5	33	.43	1.15	
9	11	-	95.0	11	.41	0.86	
10	5	-	98.0	5	.27	0.35	



		3	4	5	6	7	8
VI	1	90	35	37.5	55	.59	1.70
	2	81	22	48.5	59	.585	1.75
	3	59	18	61.5	41	.44	1.2
	4	53	9	69.0	44	.53	1.45
	5	47	2	75.5	45	.665	2.00
	6	37	7	78.0	30	.43	1.20
	7	29	6	82.5	23	.39	1.00
	8	33	2	82.5	31	.57	1.65
	9	31	2	83.5	29	.555	1.6
	10	28	2	85.0	26	.53	1.50
	11	25	5	85.0	20	.38	1.00
	12	24	4	86.0	20	.40	1.00
	13	24	4	86.0	20	.40	1.5
	14	23	4	86.5	19	.39	1.00
	15	15	1	91.5	15	.49	1.35
	16	9	3	94.0	6	.22	0.16
	17	11	-	95.0	11	.41	0.86
	18	3	-	99.0	3	.17	0.30
VII	1	80	41	39.5	39	.41	1.15
	2	69	45	43.0	24	.25	0.65
	3	71	37	46.0	34	.35	0.95
	4	62	15	61.5	47	.50	1.4
	5	42	17	70.5	25	.275	0.8
	6	47	12	70.5	35	.42	1.1



105  
T A B L E 84

Standard VII		Subject : Science					
Sub Test No.	Item No.	Upper U %	Lower L %	Difficulty value 100-U+L 2	Vali- dity V-U-L	Relia- bility V-U-L	Discrimi- nation
1	2	3	4	5	6	7	8
I	1	98	94	4.0	4	.19	.6
	2	98	89	6.5	9	.32	.9
	3	97	89	7.0	8	.265	.75
	4	96	86	9.0	10	.26	.8
	5	94	87	9.5	7	.17	.55
	6	93	79	14.0	14	.27	.8
	7	96	75	14.5	21	.41	1.15
	8	89	79	16.0	10	.165	0.5
	9	93	74	16.5	19	.33	0.9
	10	91	72	18.5	19	.30	0.85
	11	89	73	19.0	16	.245	0.7
	12	99	62	19.50	37	.67	2.1
	13	86	72	21.0	14	.20	.55
	14	85	67	24.0	18	.245	.65
	15	85	67	24.0	18	.245	.7
	16	90	61	24.5	29	.39	1.1
	17	80	68	26.0	12	.19	0.45
	18	89	57	27.0	32	.395	1.1
	19	93	51	28.0	42	.535	1.55
	20	85	51	32.0	34	.405	1.1
	21	90	45	32.0	45	.52	1.5
	22	75	50	32.5	25	.27	0.75
	23	81	47	36.0	34	.37	1.0
	24	80	46	37.0	34	.37	1.0
	25	76	48	38.0	28	.30	0.85
	26	69	54	38.5	15	.16	0.45
	27	83	40	38.5	43	.46	1.3
	28	70	45	42.5	25	.26	0.7
	29	61	44	47.5	17	.17	.45
	30	60	38	51.0	22	.22	.6



1	2	3	4	5	6	7	8
	51	43	26	65.5	17	.19	.5
	32	42	26	66.0	16	.18	.50
	35	33	18	74.5	15	.19	.50
	34	27	12	80.5	15	.225	.60
II	1	94	62	22.0	32	.47	1.35
	2	90	57	26.5	33	.42	1.3
	3	77	53	35.0	24	.265	0.15
	4	83	44	36.5	39	.425	1.1
	5	79	28	46.5	51	.51	1.4
	6	75	28	48.5	47	.47	1.1
	7	68	32	50.0	36	.37	0.31
	8	68	24	54.0	44	.45	1.2
	9	37	30	66.5	7	.08	0.21
	10	63	26	56.0	37	.38	0.77
	11	53	41	53.0	12	.12	0.31
	12	93	72	18.5	19	.30	0.87
	13	63	24	57	39	.40	0.64
	14	75	10	58	65	.66	1.45
	15	66	15	59.5	51	.53	1.6
	16	61	16	61.5	45	.48	1.3
	17	68	8	62.0	60	.64	1.9
	18	61	15	62.0	46	.49	1.2
	19	50	17	66.5	33	.375	1.0
	20	44	16	70.0	28	.33	0.5
	21	46	6	74.0	40	.53	1.5
	22	41	5	77.0	36	.52	1.5
	23	39	3	79.0	36	.575	1.7
	24	31	2	83.5	29	.555	1.6
	25	27	1	86.0	26	.60	1.7
	26	14	3	91.5	11	.315	0.8



		1	2	3	4	5	6	7	8
III	1	93		64	21.5	29	.425	1.2	
	2	92		51	28.5	41	.515	1.5	
	3	87		49	32.0	38	.435	1.2	
	4	76		48	38.0	28	.30	0.85	
	5	81		39	40.0	42	.44	1.25	
	6	75		40	42.5	35	.36	1.0	
	7	83		29	44.0	54	.545	1.55	
	8	81		28	45.5	53	.53	1.55	
	9	79		28	46.5	51	.51	1.45	
	10	78		20	51.0	58	.57	1.7	
	11	76		14	55.0	62	.62	1.9	
	12	36		7	78.5	29	.425	1.15	
	13	56		45	49.5	11	.11	0.35	
	14	72		69	29.5	3	.03	0.15	
	15	55		20	62.5	35	.38	1.0	
	16	58		13	64.5	45	.495	1.4	
	17	51		17	66.0	34	.38	1.0	
	18	54		13	66.5	41	.465	1.3	
	19	51		14	67.5	37	.425	1.15	
	20	50		10	70.0	40	.48	1.35	
	21	42		7	75.5	35	.475	1.35	
	22	38		4	79.0	34	.53	1.5	
	23	22		1	88.5	21	.55	1.6	
	24	14		1	92.5	13	.46	1.3	
	25	12		3	92.5	9	.285	.75	
	26	2		1	98.5	1	.11	.35	
IV	1	96		67	18.5	29	.485	1.45	
	2	92		66	21.0	26	.38	1.1	
	3	96		62	21.0	34	.53	1.55	
	4	94		58	24.0	36	.50	1.45	
	5	92		44	32.0	48	.56	1.65	
	6	90		45	32.5	45	.52	1.5	



1	2	3	4	5	6	7	8
	7	79	53	34.0	26	.29	0.8
	8	83	37	40.0	46	.485	1.4
	9	82	37	40.5	45	.475	1.35
	10	74	38	44.0	36	.37	1.0
	11	77	34	44.5	43	.44	1.25
	12	77	33	45.0	44	.45	1.25
	13	74	35	45.5	39	.40	1.1
	14	76	29	47.5	47	.47	1.1
	15	64	25	55.5	39	.40	1.1
	16	62	20.	59.0	42	.44	1.6
	17	58	21	60.5	37	.39	1.0
	18	58	15	63.0	43	.465	1.7
	19	58	15	63.5	43	.465	1.35
	20	47	25	64.0	22	.24	0.65
	21	42	27	65.5	15	.16	0.45
	22	49	11	70.0	38	.455	1.25
V	1	94	46	30.0	48	.59	1.8
	2	91	40	34.5	51	.575	1.7
	3	93	38	34.5	55	.62	1.9
	4	85	36	39.5	49	.515	1.5
	5	81	32	43.5	49	.50	1.45
	6	79	33	44.0	46	.47	1.35
	7	69	42	44.5	27	.28	0.7
	8	83	26	45.5	57	.57	1.7
	9	82	27	45.5	55	.55	1.6
	10	90	18	46.0	72	.71	2.25
	11	84	22	47.0	62	.61	1.8
	12	75	27	49.0	48	.48	1.35
	13	67	33	50.0	34	.35	0.95
	14	80	19	50.5	61	.605	1.8
	15	65	33	51.0	32	.35	0.9



	1	2	3	4	5	6	7	8
	16	73	23	52.0	50	.50	1.45	
	17	58	21	60.5	37	.39	1.05	
	18	51	25	62.0	26	.28	0.8	
	19	44	19	68.5	25	.285	0.75	
	20	44	16	70.0	28	.33	0.9	
	21	40	11	74.5	29	.38	1.0	
	22	31	17	76.0	14	.185	0.5	
VI	1	69	31	50.0	38	.385	1.05	
	2	64	32	52.0	32	.33	0.85	
	3	60	31	54.5	29	.30	0.8	
	4	70	20	55.0	50	.51	1.45	
	5	75	40	42.5	35	.36	1.0	
	6	40	13	73.5	27	.345	0.9	
	7	51	9	70.0	42	.505	1.45	
	8	15	2	91.5	13	.385	1.0	
	9	83	16	50.5	67	.66	2.0	
	10	15	4	90.5	11	.28	0.7	
	11	59	23	59.0	36	.375	1.0	
	12	29	8	81.5	21	.335	0.9	
	13	31	9	80.0	22	.335	0.9	
VII	1	99	93	4.0	6	.325	1.0	
	2	94	83	11.5	11	.245	0.7	
	3	61	33	53.0	28	.29	0.8	
	4	59	26	57.5	33	.34	0.95	
	5	65	18	58.5	47	.485	1.35	
	6	71	19	55.0	52	.525	1.5	
	7	64	11	62.5	53	.565	1.6	
	8	68	18	57.0	50	.51	1.45	
	9	62	3	67.5	59	.705	2.2	
	10	49	4	73.5	45	.605	1.8	
	11	32	4	82.0	28	.48	1.3	



1	2	3	4	5	6	7	8
12	12	0	94.0	12	0	1.25	
13	50	7	71.5	43	.54	1.55	
14	39	12	74.5	27	.35	0.95	
15	50	8	71.0	42	.52	1.4	
16	1	0	99.5	1	0	0.1	
17	19	2	89.5	17	.445	1.2	
18	22	3	87.5	19	.43	1.2	
• • • • •							

T A B L E 85

Standard VI		Subject: Guja					
Sub Test No.	Item No.	Upper U %	Lower L %	Diffi- culty Value $\frac{100-U+L}{2}$	Validi- ty V-U-L	Relia- bility.	Disci- minan-
I	1	89	58	26.5	31	.395	1.1
	2	91	31	39.0	60	.63	1.9
	3	73	36	45.5	37	.38	1.0
	4	69	38	46.5	31	.32	0.8
	5	69	34	48.5	35	.36	0.9
	6	70	29	50.5	41	.41	1.1
	7	74	25	51.0	49	.49	0.9
	8	55	41	52	14	.14	0.3
	9	70	25	53	45	.45	0.6
	10	58	30	56	28	.29	0.6
	11	72	15	57	57	.59	1.2
	12	56	26	59	30	.32	0.4
	13	50	29	60.5	21	.22	0.6



## III

	1	2	3	4	5	6	7	8
	14	57		16	63.5	41	.445	1.2
	15	44		30	63.0	14	.15	0.3
	16	62		11	63.5	51	.555	1.6
	17	51		20	64.5	31	.34	0.9
	18	58		11	66.0	47	.53	1.10
	19	41		17	71.0	24	.29	0.65
	20	38		11	75.5	27	.36	0.95
	21	33		8	79.5	25	.375	1.0
	22	26		13	80.5	13	.195	0.9
	23	23		14	81.5	9	.135	0.35
	24	32		5	81.5	27	.45	1.2
	25	24		13	81.5	11	.17	0.45
II	1	99		74	13.5	25	.59	1.8
	2	94		66	20.0	28	.44	1.2
	3	93		56	25.5	37	.495	1.4
	4	89		44	33.5	45	.51	1.45
	5	89		44	33.5	45	.51	1.45
	6	82		37	40.5	45	.475	1.35
	7	72		38	45.0	34	.35	0.95
	8	71		23	53.0	48	.48	1.3
	9	42		16	71.0	26	.31	0.85
	10	21		8	85.5	13	.24	0.65
III	1	92		74	17.0	18	.30	0.8
	2	92		62	23.0	30	.42	1.15
	3	90		61	24.5	29	.39	1.05
	4	79		50	35.5	29	.32	0.9
	5	89		38	36.5	51	.355	1.65
	6	90		32	39.0	58	.61	1.85
	7	72		49	40.0	23	.25	0.49
	8	79		36	43.0	43	.45	0.40



1	2	3	4	5	6	7	8
	9	72	39	45.0	33	0.34	0.52
	10	76	30	47.0	46	0.46	1.3
	11	80	24	48.0	56	0.56	1.15
	12	76	27	49.0	49	0.49	0.98
	13	70	25	53.0	45	0.45	0.65
	14	67	24	54.5	43	0.44	1.2
	15	65	23	56.0	42	0.44	0.92
	16	45	24	66.0	21	0.25	0.31
	17	45	12	71.5	33	0.40	1.5
	18	39	5	78.0	34	0.50	1.05
	19	40	4	78.0	36	0.54	1.5
	20	33	7	80.0	26	0.405	1.05
	21	31	2	83.5	29	0.595	1.6
	22	16	6	89.0	10	0.23	0.55
	23	21	1	89.0	20	0.54	1.55
	24	12	3	92.5	9	0.285	0.7
	25	5	1	97.0	4	0.265	0.7
IV	1	97	75	14.0	22	0.455	1.3
	2	90	72	19.0	20	0.28	0.75
	3	89	72	19.5	17	0.26	0.7
	4	89	71	20.0	18	0.26	0.7
	5	88	61	25.5	27	0.35	0.95
	6	77	56	33.5	21	0.235	0.65
	7	80	39	40.5	59	0.43	1.2
	8	69	49	41.5	21	0.22	0.6
	9	72	44	42.0	28	0.29	0.8
	10	69	45	43.0	24	0.25	0.65
	11	73	37	45.0	36	0.37	0.54
	12	71	35	47.0	36	0.37	0.75
	13	73	32	48.0	41	0.41	0.81
	14	72	30	49.0	42	0.42	0.50
	15	75	24	51.0	51	0.51	1.00



1	2	3	4	5	6	7	8
16	58	37	52.5	21	.21	0.6	
17	64	29	53.5	35	.36	0.95	
18	75	20	53.0	55	.55	1.04	
19	67	23	55.0	44	.45	0.84	
20	56	30	57.0	26	.27	0.7	
21	51	28	59.0	26	.27	0.85	
22	51	27	61.0	24	.255	0.7	
23	49	21	65.0	28	.31	0.8	
24	41	24	67.5	17	.19	0.55	
25	27	14	79.5	13	.19	0.45	
V (A)	1	84	50	33.0	34	.39	1.95
	2	88	41	35.5	47	.515	1.5
	3	85	36	39.5	40	.515	1.9
	4	67	12	61.0	55	.58	1.20
	5	40	9	75.5	31	.42	1.1
	6						
(B)	1	82	18	50.0	64	.63	1.9
	2	81	17	51.0	64	.63	1.9
	3	59	21	55.0	48	.49	1.0
	4	78	11	55.5	67	.67	2.05
	5	75	12	56.5	63	.635	1.9
	6	72	13	57.5	59.0	.60	1.25
	7	74	8	59.0	66.0	.68	2.1
	8	69	6	62.5	63	.675	2.1
VI (A)	1	96	50	27.0	46	.61	1.85
	2	96	44	30.0	52	.64	1.95
	3	86	38	38.0	48	.51	1.45
	4	81	31	44.0	50	.51	1.45
	5	73	37	45.0	36	.37	0.54
	6	78	23	49.0	55	.55	1.6
	7	84	14	51.0	70	.68	1.62
	8	77	18	52.0	59	.59	1.75



	1	2	3	4	5	6	7	8
	9		74		19	53.0	55	.55 1.55
	10		67		17	58.0	50	.51 1.00
Part II	1		57		40	52	17	.17 0.12
	2		65		23	56	42	.44 0.92
	3		55		24	60.0	31	.33 0.9
	4		71		5	62.0	66	.705 2.25
	5		69		3	64.0	66	.74 2.4
	6		56		14	65.0	42	.47 1.3
	7		55		15	65.0	80	.445 1.2
	8		58		10	66.0	48	.54 1.5
	9		41		2	78.0	39	.625 1.9
	10		38		1	80.0	37	.67 2.05
VII	1		93		45	31.0	48	.575 1.7
	2		96		51	26.0	45	.605 1.8
	3		78		39	41.0	39	.41 1.1
	4		71		28	50.0	43	.43 1.2
	5		40		14	73.0	26	.33 0.9
	6		39		15	73.0	24	.31 0.87
	7		32		14	77.0	18	.25 0.15
	8		39		4	79.0	55	.54 0.96
	9		33		2	83.0	31	.57 1.02
	10		19		5	88.0	14	.31 0.49
	11		9		3	94.0	6	.22 0.16

TABLE 86

Standard VI

Subject: Hindi

Sub Test No.	Item No.	Upper U %	Lower L %	Difficult value 100-U+L 2	Validity V-U-L	Relia- bility	Discrimina- tion.
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I	1	93	44	31.5	49	.58	1.75
	2	84	40	38.0	44	.47	1.35



1	2	3	4	5	6	7	8
		3	87	31	41.0	56	.575
		4	90	28	41.0	62	.64
		5	85	27	44.0	58	.59
		6	68	35	48.5	33	.34
		7	74	23	51.5	51	.51
		8	71	25	52.0	46	.46
		9	73	21	53.0	52	.52
		10	67	25	54.0	42	.425
		11	66	23	55.5	43	.44
		12	63	26	56.0	37	.38
		13	63	24	57	39	.40
		14	75	10	58	65	.66
		15	67	15	59	52	.54
		16	64	18	59	46	.48
		17	58	22	60	36	.38
		18	59	21	60	38	.40
		19	57	23	60	34	.36
		20	48	30	61.0	18	.19
		21	58	19	61.5	39	.415
		22	59	17	62.0	42	.45
		23	52	22	63.0	30	.33
		24	45	24	65.5	21	.23
		25	46	20	67.0	26	.29
		26	37	27	68.0	10	.115
		27	51	9	70.0	42	.505
		28	22	21	78.5	1	.015
		29	43	10	73.5	33	.42
		30	32	15	76.5	17	.23
II	1	93	50	28.5	43	.54	1.6
	2	95	56	24.5	39	.545	1.56
	3	76	33	45.5	43	.44	1.25
	4	71	20	54.5	51.	.515	1.45



1	2	3	4	5	6	7	8
	5	72	14	57.0	58	.59	1.75
	6	51	22	63.5	29	.32	0.9
	7	55	12	66.5	43	.485	1.4
	8	51	8	70.5	43	.525	1.5
	9	18	7	87.5	11	.23	0.6
	10	15	2	92.0	13	.38	0.42
III	1	96	75	14.5	21	.41	1.15
	2	70	51	39.5	19	.20	0.55
	3	68	46	43.0	22	.23	0.65
	4	73	37	45.0	36	.37	1.0
	5	63	35	51.0	28	.29	0.8
	6	64	31	52.5	33	.34	0.9
	7	66	27	53.5	39	.40	1.1
	8	54	30	58.0	24	.25	0.7
	9	54	29	58.5	25	.26	0.7
	10	56	26	59.0	30	.32	0.9
	11	53	28	59.5	25	.265	0.7
	12	50	27	61.5	23	.245	0.65
	13	47	23	65.0	24	.265	0.7
	14	57	10	67.0	47	.54	0.98
	15	43	21	68.0	22	.25	0.65
	16	40	16	72.0	24	.30	0.8
	17	42	12	72.0	29	.36	1.0
	18	35	17	74.0	18	.23	0.6
	19	35	12	76.5	23	.31	0.85
	20	30	6	82.0	24	.40	1.1
IV	1	86	30	42.0	56	.57	1.7
(Part I)	2	85	28	43.5	57	.58	1.7
	3	85	18	48.5	67	.66	2.0
	4	77	25	49.0	52	.52	1.18
	5	78	21	50.5	57	.565	1.65



1	2	3	4	5	6	7	8
6	76	13	55.5	63	.63	1.9	
7	63	26	56.0	37	.38	0.71	
8	44	18	69.0	26	.30	0.71	
9	47	14	70.0	33	.39	0.58	
10							
Part II	1	72	16	56.0	56	.57	1.65
	2	58	20	61.0	38	.40	1.1
	3	49	16	67.5	33	.38	1.0
	4	46	5	74.5	41	.55	1.6
	5	21	3	88.0	18	.42	1.1
	6	21	3	88.0	18	.42	1.1
	7	17	6	88.5	11	.245	0.6
	8	17	1	92.0	16	.50	0.89
	9	5	0	98.0	5	.27	0.35
V	1	90	41	34.5	49	.55	1.6
	2	85	26	44.5	59	.59	1.75
	3	58	28	57.0	30	.31	0.85
	4	53	32	57.5	21	.22	0.6
	5	72	15	57.0	57	.59	1.20
	6	63	24	57	39	.40	0.72
	7	60	25	57.5	35	.36	1.0
	8	64	22	57.0	42	.43	1.2
	9	25	6	84.5	19	.34	0.9
	10	72	34	47.0	38	.39	1.05
	11	63	9	64.0	54	.59	1.75
	12	24	5	85.5	19	.365	1.0
	13	37	5	79.0	32	.49	1.3
	14	17	1	92.0	16	.50	0.89
VI	1	90	75	17.5	15	.24	0.7
	2	83	64	26.5	19	.24	0.65
	3	89	66	22.5	23	.32	0.9



1	2	3	4	5	6	7	8
	4	94	68	19.0	26	.42	1.2
	5	65	24	55.5	41	.42	1.15
	6	44	21	67.5	23	.26	0.7
	7	82	54	32.0	28	.32	0.9
	8	58	25	58.5	33	.34	0.95
	9	58	24	59.0	34	.36	0.95
	10	83	53	32.0	30	.34	0.95
VII	1	89	42	34.5	47	.525	1.5
	2	82	38	40.0	44	.47	1.3
	3	92	49	29.5	43	.525	1.55
	4	92	36	36.0	56	.61	1.85
	5	69	26	52.5	43	.43	1.2
	6	98	46	28.0	52	.70	2.25
	7	90	31	39.5	59	.62	1.9
	8	78	16	53.0	62	.61	1.85
VIII	1	91	23	43.0	68	.685	2.15
	2	82	26	46.0	56	.56	1.65
	3	86	18	48.0	68	.67	2.05
	4	78	21	50.5	57	.565	1.65
	5	83	15	51.0	68	.67	2.05
	6	77	20	51.5	57	.567	1.65
	7	74	19	53.5	55	.55	1.6
	8	68	17	57.5	51	.52	1.5
	9	71	10	59.5	61	.635	1.9
	10	63	15	61.0	48	.505	1.45
	11	53	21	63.0	52	.345	0.95
	12	61	5	67.0	56	.656	1.95
	13	38	7	77.5	31	.445	1.25
	14	23	5	86.0	18	.355	0.9
	15	15	25	90.0	10	.245	0.6



1	2	3	4	5	6	7	8
16	9	1	95.0	8	.375	1.0	
17	5	0	98.0	5	.27	0.35	
18	5	2	98.0	3	.16	0.30	

TABLE 87

Standard VI

Subject: Arithmetic

Sub Test No.	Item No.	Upper U %	Lower L %	Difficult Value 100-U+L 2	Vali- dity V-U-L	Relia- bility V-U-L	Discri- mination
I	1	95	57	24.0	38	.54	1.6
	2	85	65	25.0	20	.265	0.7
	3	92	35	56.5	57	.62	1.9
	4	87	30	41.5	57	.585	1.7
	5	61	32	53.5	29	.30	0.8
	6	65	20	57.5	45	.465	1.3
	7	65	10	62.5	55	.59	1.7
	8	41	14	72.5	27	.335	0.9
	9	46	5	74.5	41	.51	1.6
	10	41	6	76.5	35	.49	1.4
	11	38	2	80.0	36	.61	1.8
	12	23	5	86.0	18	.355	0.95
	13	25	3	86.0	22	.46	1.25
	14	20	2	89.0	18	.46	1.25
	15	10	-	91.0	14	.40	1.1
	16	14	2	92.0	12	.37	1.0
II	1	97	68	17.5	29	.52	1.5
	2	88	70	21.0	18	.26	0.7
	3	90	56	27.0	34	.43	1.2
	4	78	62	30.0	16	.19	0.5



1	2	3	4	5	6	7	8
	5	88	36	38.0	52	.55	1.65
	6	84	36	40.0	48	.50	1.45
	7	71	47	41.0	24	.255	0.7
	8	70	43	43.5	27	.28	0.75
	9	69	43	44.0	26	.27	0.7
	10	72	39	44.5	33	.34	0.95
	11	65	41	47.0	24	.25	0.7
	12	65	39	48.0	26	.27	0.7
	13	65	29	53.0	36	.37	1.0
	14	64	25	55.5	39	.40	1.1
	15	57	32	55.5	25	.26	0.7
	16	64	20	58.0	44	.44	1.25
	17	56	28	58.0	28	.29	0.8
	18	37	27	68.0	10	.115	0.3
III	1	82	68	25.0	14	.18	0.5
	2	64	46	45.0	18	.19	0.5
	3	74	33	46.5	41	.415	1.15
	4	68	34	49.0	34	.35	0.95
	5	58	36	53.0	22	.22	0.6
	6	56	23	60.5	33	.35	0.95
	7	61	16	61.5	45	.48	1.35
	8	47	27	63.0	20	.215	0.55
	9	63	30	63.5	33	.34	0.9
	10	40	21	69.5	19	.225	0.6
	11	57	4	70.0	53	.65	1.30
	12	47	10	71.5	37	.46	1.2
	13	43	7	75.0	36	.485	1.35
	14	34	8	79.0	26	.38	1.0
	15	33	5	81.0	28	.46	1.25
	16	23	3	87.0	20	.44	1.2
	17	15	1	92.0	14	.475	1.3



1	2	3	4	5	6	7	8
IV	1	57	36	53.5	21	.215	0.6
	2	32	18	75.0	14	.18	0.5
	3	59	37	52.0	22	.22	0.6
	4	34	14	76.0	20	.27	0.7
	1	43	16	70.5	27	.32	0.85
	2	66	20	57.0	46	.47	1.3
	3	28	12	80.0	16	.24	0.6
	2	31	11	79.0	20	.29	0.75
	3	34	7	78.5	27	.41	1.1
V	1	87	21	46.0	66	.655	2.0
	2	77	12	55.5	65	.65	1.9
	3	86	22	46.0	64	.63	1.95
	4	45	2	76.5	43	.65	1.9
	5	32	14	77.0	18	.25	0.15
	6	24	1	87.5	23	.57	1.65
	7	31	1	84.0	30	.625	1.9
	8	19	4	89.0	15	.35	0.12
VI	1	70	19	55.5	51	.52	1.45
	2	57	11	66.0	46	.52	1.45
	3	62	11	63.5	51	.555	1.55
	4	44	18	69.0	26	.30	0.71
	5	95	80	12.5	15	.325	0.9
	6	52	36	56.0	16	.17	0.45
	7	88	49	31.5	39	.455	1.3
	8	39	1	80.0	38	.675	2.1
	9	47	4	74.5	43	.59	1.7
	10	48	14	69.0	34	.40	1.1
	11	31	7	81.0	24	.385	1.0
	12	59	2	69.5	57	.725	2.35
	13	25	1	87.0	26	.58	1.7
	14	36	1	81.5	35	.66	2.0



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1	2	3	4	5	6	7	8
VII	1	70	26	52.0	44	.44	1.25
	2	61	16	61.5	45	.48	1.35
	3	40	8	76.0	32	.44	1.25
	4	36	8	78.0	28	.40	1.1
	5	36	9	78.0	27	.38	1.0
	6	27	1	86.0	26	.60	1.75

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TABLE 88

<u>Standard VI</u>		<u>Subject: History</u>					
Sub Test No.	Item No.	Upper U %	Lower L %	Difficult value 100-U+L $\frac{2}{2}$	Vali- dity V-U-L	Relia- bility	Discrimi- nation
1	2	3	4	5	6	7	8
I	1	95	76	14.5	19	.37	0.95
	2	94	76	15.0	18	.33	0.9
	3	100	62	19.0	38	.68	-
	4	95	60	22.5	35	.51	1.5
	5	90	60	25.0	30	.40	1.05
	6	87	60	26.5	27	.35	0.95
	7	94	53	26.5	41	.54	1.55
	8	87	60	26.5	27	.345	0.95
	9	83	60	28.5	23	.285	0.75
	10	80	60	30.0	20	.24	0.6
	11	88	50	31.0	38	.45	1.3
	12	88	46	33.0	42	.48	1.25
	13	85	49	33.0	36	.39	1.0
	14	83	45	36.0	38	.45	1.15
	15	79	47	37.0	32	.33	0.95
	16	85	39	38.0	46	.49	1.4
	17	74	50	38.0	24	.26	0.65



1	2	3	4	5	6	7	8
	18	82	41	38.5	41	.44	1.2
	19	78	44	39.0	34	.36	0.95
	20	78	42	40.0	36	.38	1.0
	21	71	52	39.0	19	.21	0.28
	22	87	35	39.0	52	.55	0.80
	23	89	32	39.0	57	.60	0.99
	24	75	46	40.0	29	.31	0.59
	25	77	44	40.0	33	.35	0.75
	26	72	49	40.0	23	.25	0.49
	27	78	43	39.5	35	.37	1.0
	28	79	40	41.0	39	.41	0.65
	29	90	27	42.0	63	.65	1.25
	30	88	29	42.0	59	.61	1.20
	31	70	46	42.0	24	.25	1.65
	32	66	38	48.0	28	.29	0.65
	33	58	37	52.5	21	.24	0.6
	34	56	26	59.0	30	.32	0.9
	35	51	25	62.0	26	.28	0.75
	36	31	27	71.0	4	.06	0.1
II	1	92	75	16.5	17	.29	0.7
	2	86	34	40.0	52	.54	1.55
	3	95	23	41.0	72	.74	2.45
	4	78	27	47.5	51	.51	1.55
	5	82	12	53.0	70	.69	2.2
	6	80	10	55.0	70	.70	2.25
	7	72	4	62.0	68	.73	2.45
	8	53	7	70.0	46	.56	1.6
	9	51	4	72.5	47	.615	1.8
	10	47	8	72.5	39	.50	1.4
	11	39	7	77.0	32	.455	1.25
	12	41	3	78.0	38	.595	1.65



1	2	3	4	5	6	7	8
	13	39	2	79.5	37	.615	2.35
	14	32	1	83.5	31	.63	2.41
	15	30	2	84.0	28	.55	1.55
III	1	74	43	41.5	31	.325	0.9
	2	81	34	42.5	47	.48	1.35
	3	85	20	47.5	65	.64	1.95
	4	83	24	47.0	59.	.59	1.09
	5	65	38	49.0	27	.28	0.51
	6	72	28	50.0	44	.44	0.68
	7	69	27	52.0	42	.42	0.72
	8	56	19	63.0	37	.40	0.51
	9	44	18	69.0	26	.30	0.71
	10	47	14	70.0	33	.39	0.58
	11	39	15	73.0	24	.31	0.87
	12	39	4	79.0	35	.54	0.96
	13	33	2	83.0	31	.57	1.02
IV	1	92	64	22.0	28	.40	1.0
	2	88	46	33.0	42	.48	1.35
	3	78	51	35.5	27	.30	0.8
	4	81	38	40.5	43	.45	1.25
	5	85	33	41.0	52	.55	1.5
	6	83	33	42.0	50	.50	1.45
	7	80	32	44.0	48	.49	1.4
	8	71	39	45.0	32	.34	0.85
	9	80	24	48.0	56	.56	1.15
	10	74	25	51.0	49	.49	0.95
	11	65	29	53.0	36	.365	1.0
	12	73	16	55.5	57	.575	1.6
	13	59	25	58.0	34	.34	0.95
	14	55	29	58.0	26	.28	0.8
	15	57	24	59.5	33	.35	0.95



	1	2	3	4	5	6	7	8
	16	48	12	70.0	36	.43	1.15	
	17	43	10	73.5	33	.42	1.15	
	18	40	14	73.5	26	.33	0.9	
	19	35	15	75.0	20	.25	0.65	
	20	32	14	77.0	18	.25	0.6	
V	1	74	28	49.0	46	.46	1.3	
	2	69	27	52.0	42	.43	1.15	
	3	65	28	53.5	37	.38	1.0	
	4	59	25	58.0	34	.35	0.95	
	5	65	19	58.0	46	.48	1.30	
	6	56	26	59.0	30	.32	0.49	
	7	57	24	59.5	33	.35	0.95	
	8	59	21	60.0	38	.40	0.51	
	9	54	25	60.5	29	.31	0.85	
	10	57	20	61.5	37	.395	1.5	
	11	26	22	76.0	4	.06	0.15	
VI	1	60	31	54.5	29	.30	0.8	
	2	58	13	64.5	45	.50	1.4	
	3	39	18	71.5	21	.26	0.7	
	4	41	5	77.0	36	.52	1.45	
	5	29	7	82.0	22	.36	0.95	
	6	27	5	84.0	22	.39	1.05	
	7	18	7	88.0	11	.23	0.40	
	8	17	2	90.5	15	.415	1.1	
	9	13	3	92.0	10	.30	0.75	
	10	10	2	94.0	8	.30	0.75	
VII	1	94	49	28.5	45	.565	1.5	
	2	77	41	41.0	36	.38	1.0	
	3	75	18	53.5	57	.57	1.52	
	4	71	15	57.0	56	.57	1.75	
	5	66	13	60.5	53	.55	1.55	
	6	65	9	63.0	56	.61	1.75	
	7	57	6	68.5	51	.605	1.8	
	8	53	7	70.0	46	.56	1.6	
	9	55	4	71.0	51	.635	1.95	
VI/16	10	26	4	85.0	22	.42	1.1	



TABLE 89

Standard VI		Subject: Geography					
Sub-test No.	Item No.	Upper U %	Lower L %	Difficulty Value $\frac{100-U+L}{2}$	Validity V = U-L	Reliability	Discrimination
I	1	96	83	10.5	13	.315	0.90
	2	81	46	36.5	35	.38	1.05
	3	64	44	46.0	20	.21	0.55
	4	62	42	48.0	20	.20	0.55
	5	59	35	53.0	24	.25	0.65
	6	71	24	53.0	47	.47	0.90
	7	65	27	54.0	38	.39	0.25
	8	58	34	54.0	24	.25	0.35
	9	63	26	56.0	37	.38	0.71
	10	63	24	57.0	39	.40	0.72
	11	53	33	57.0	20	.25	0.49
	12	51	32	58.5	10	.10	0.55
	13	75	10	58.0	65	.66	1.45
	14	67	15	59.0	52	.54	0.92
	15	58	22	60.0	36	.38	0.80
	16	63	10	64.0	53	.58	0.95
	17	58	8	67.0	50	.58	0.95
	18	57	10	67.0	47	.54	0.98
	19	49	16	68.0	33	.38	0.60
	20	57	5	69.0	52	.63	1.13
	21	59	18	70.0	41	.44	0.70
	22	49	12	70.0	37	.42	0.65
	23	51	8	71.0	43	.53	0.90
	24	42	14	72.0	28	.34	0.62
	25	45	9	73.0	39	.46	1.10
	26	45	10	73.0	35	.44	0.60
	27	46	8	73.0	38	.49	1.00
	28	44	8	74.0	36	.47	0.85



	1	2	3	4	5	6	7	8
	29	50	2	74	48	.68	1.10	
	30	42	9	75	33	.43	0.90	
	31	40	8	76	32	.44	0.80	
	32	32	14	77	18	.25	0.15	
	33	39	4	79	35	.54	0.96	
	34	40	3	79	37	.58	0.86	
	35	37	4	80	33	.52	0.91	
	36	33	2	83	31	.57	1.02	
	37	19	5	88	14	.31	0.49	
	38	18	7	88	11	.23	0.40	
	39	17	1	92	16	.50	0.89	
	40	5	0	98	5	.27	0.35	
II	1	88	82	15	6	.11	0.35	
	2	90	71	20	19	.29	0.55	
	3	83	29	44	54	.55	1.6	
	4	78	34	44	44	.45	0.73	
	5	83	24	47	59	.59	1.09	
	6	71	31	49.0	40	.40	1.05	
	7	65	38	49.0	27	.28	0.51	
	8	72	28	50.0	44	.44	0.68	
	9	71	24	53.0	47	.47	0.90	
	10	65	27	54.0	38	.39	0.25	
	11	76	14	55.0	62	.62	1.90	
	12	56	19	63.0	37	.40	0.61	
	13	46	9	72.5	37	.47	1.3	
	14	43	5	76.0	38	.53	1.5	
	15	41	3	78.0	38	.59	1.7	
	16	35	4	80.5	31	.50	1.4	
	17	23	3	87.0	20	.43	1.2	
	18	19	5	88.0	14	.31	0.49	



1	2	3	4	5	6	7	8
III	1	91	37	36.0	54	.59	1.8
	2	84	39	38.5	45	.48	1.7
	3	71	52	39.0	19	.21	0.28
	4	71	39	45.0	32	.32	0.85
	5	74	25	51.0	49	.49	0.95
	6	65	23	56.0	42	.44	0.92
	7	58	23	59.5	35	.37	1.0
	8	66	15	59.5	51	.53	1.5
	9	51	12	68.5	39	.455	1.25
	10	42	9	74.5	33	.43	1.2
	11	45	6	74.5	39	.525	1.5
	12	32	2	82.5	30	.56	1.65
	13	28	5	83.5	23	.41	1.1
	14	19	5	88.0	14	.31	0.49
	15	16	1	91.5	15	.12	1.4
	16	7	1	96.0	6	.325	0.9
IV	1	100	97	1.5	3	-	-
	2	92	78	15.0	4	.25	0.7
	3	94	76	15.0	18	.33	0.9
	4	92	73	17.5	19	.31	0.85
	5	93	60	23.5	33	.46	1.3
	6	92	56	26.0	36	.47	1.3
	7	87	54	29.5	33	.39	1.1
	8	83	58	30.0	25	.30	0.74
	9	81	53	33.0	28	.32	0.30
	10	87	44	35.0	43	.48	0.45
	11	87	35	39.0	52	.55	0.80
	12	72	40	44.0	34	.33	0.9
	13	72	40	44.0	32	.33	0.9
	14	60	19	60.5	41	.43	1.15
	15	61	14	62.5	47	.51	1.4



	1	2	3	4	5	6	7	8
	16	56	19	63	37	.40	0.61	
	17	61	14	62.5	47	.51	1.4	
	18	50	18	66.0	32	.36	0.95	
V	1	90	71	20.0	19	.29	0.55	
	2	82	58	30.0	24	.28	0.75	
	3	81	53	33.0	28	.32	0.45	
	4	69	15	58.0	54	.55	1.6	
	5	44	8	74.0	36	.47	0.85	
	6	38	13	75.0	25	.33	0.48	
	7	38	4	79.0	34	.53	1.45	
	8	36	4	80.0	32	.51	1.4	
	9	15	3	91.0	12	.32	0.8	
	10	14	4	91.0	10	.26	0.65	
	11	26	10	82.0	16	.26	0.65	
	12	37	9	77.0	28	.39	1.0	
	13	26	7	83.5	19	.33	0.85	
VI	1	93	66	21.0	17	.41	.65	
	2	89	50	31.0	39	.47	.65	
	3	90	32	39.0	58	.48	1.0	
	4	90	34	38.0	56	.60	0.97	
	5	77	45	39.0	32	.44	0.65	
	6	88	10	51	78	.76	0.50	
	7	64	18	59	46	.48	1.01	
	8	63	10	64	53	.58	0.95	
	9	68	5	64	63	.69	1.40	
	10	57	10	67	47	.54	0.98	
	11	58	8	67	50	.58	0.95	
	12	54	12	67	42	.48	1.12	
	13	49	16	68	33	.38	0.60	
	14	51	8	71	43	.53	0.90	
	15	42	14	72	28	.34	0.62	



1	2	3	4	5	6	7	8
	16	44	11	73	33	.41	0.89
	17	50	2	74	48	.68	1.10
	18	42	9	75	33	.43	0.90
	19						
VII	1	93	65	21.0	28	.41	1.2
	2	93	59	24.0	34	.45	1.3
	3	90	55	27.5	35	.44	1.1
	4	88	53	29.5	35	.42	1.15
	5	84	48	34.0	36	.40	1.1
	6	83	47	35.0	36	.395	1.1
	7	90	32	39.0	58	.61	1.0
	8	63	45	46.0	18	1.185	0.5
	9	63	41	48.0	22	.25	0.6
	10	72	28	50.0	44	.44	0.68
	11	69	27	52.0	42	.42	0.72
	12	44	18	69.0	26	.30	0.71
	13	47	14	70.0	33	.39	0.58

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TABLE 90

<u>Standard VI</u>		<u>Subject: Science</u>					
Sub Test No.	Item No.	Upper U %	Lower L %	Diffi- culty Value 100-U+L 2	Vali- dity V=U-L	Relia- bility	Discrimi- nation
1	1	99	95	3.0	4	.265	0.8
	2	95	81	12.0	14	.305	0.90
	3	98	75	13.5	23	.505	1.5
	4	95	69	17.5	26	.44	1.25
	5	85	73	21.0	12	.17	0.5
	6	92	65	21.5	27	.39	1.1
	7	88	67	22.5	21	.29	0.9



1	2	3	4	5	6	7	8
	8	86	67	23.5	19	.26	0.7
	9	82	57	30.5	25	.29	0.8
	10	72	62	33.0	10	.11	0.35
	11	83	51	33.0	32	.365	1.0
	12	77	57	33.0	20	.225	0.65
	13	75	47	39.0	28	.30	0.80
	14	74	39	43.5	35	.36	1.0
	15	77	29	47.0	48	.48	1.35
	16	64	42	47.0	22	.22	0.60
	17	81	21	49.0	60	.595	1.75
	18	60	39	50.5	21	.215	0.55
	19	67	30	51.5	37	.375	1.0
	20	65	30	53.5	35	.36	0.95
	21	61	32	53.5	29	.30	0.8
	22	53	36	55.5	17	.18	0.50
	23	56	29	57.5	27	.28	0.35
	24	57	5	69.0	52	.63	1.13
	25	61	20	59.5	41	.43	1.2
	26	44	36	60.0	8	.08	0.25
	27	47	32	60.5	15	.16	0.15
	28	48	27	62.5	21	.225	0.6
	29	40	32	64.0	8	.09	0.25
	30	43	21	68.0	22	.24	0.65
	31	48	12	70.0	36	.43	1.2
	32	29	20	75.5	9	.12	0.3
	33						
II	1	94	63	21.5	31	.46	1.15
	2	90	60	25.0	30	.40	1.10
	3	82	65	26.5	17	.215	0.5
	4	79	48	36.5	31	.34	0.95
	5	83	40	38.5	43	.46	1.3
	6	71	52	39.0	19	.21	0.28
	7	60	57	41.5	3	.03	0.15



1	2	3	4	5	6	7	8
8	73	35	46.0	38	.39	1.05	
9	83	24	47.0	59	.59	1.09	
10	65	38	49.0	27	.28	0.51	
11	72	28	50.0	44	.44	0.68	
12	69	27	52.0	42	.42	0.72	
13	65	27	54.0	38	.39	0.25	
14	68	23	54.5	45	.46	1.3	
15	53	16	65.5	37	.41	1.15	
16	45	8	73.5	37	.48	1.35	
17	44	5	75.5	39	.545	1.55	
18	33	8	79.5	25	.375	1.0	
19	27	7	83.0	20	.34	0.9	
20	32	2	83.0	30	.56	1.6	
21	23	4	86.5	19	.39	1.0	
22	16	8	88.0	8	.17	0.45	
23	22	2	88.0	20	.48	1.35	
24	20	2	89.0	18	.46	1.25	
25	13	3	92.0	10	.295	0.75	
26	12	2	93.0	10	.34	0.9	
27	11	1	94.0	10	.415	1.1	
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III	1	92	82	13.0	.20	0.55	
	2	95	63	21.0	.495	1.4	
	3	94	61	23.0	.48	1.05	
	4	89	50	31.0	.47	0.91	
	5	90	43	33.5	.535	1.55	
	6	67	34	49.5	.34	0.95	
	7	71	29	50.0	.42	1.15	
	8	74	24	51.0	.50	1.45	
	9	72	25	51.5	.47	1.35	
	10	72	15	56.5	.58	1.7	
	11	73	8	59.5	.67	2.05	
	12	60	20	60.0	.42	1.15	



1	2	3	4	5	6	7	8
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13	67	9	62.0	58	.62	1.10
14	66	9	62.5	55	.615	1.8
15	47	20	66.5	27	.30	0.8
16	45	19	68.0	26	.295	0.8
17	44	19	68.5	25	.285	0.75
18	40	19	70.5	21	.255	0.7
19	37	17	73.0	20	.255	0.65
20	41	4	77.5	37	.55	1.6
21	37	7	78.0	30	.435	1.20
22	26	8	83.0	18	.30	0.8
23	23	8	84.5	15	.265	0.7
24	29	2	84.5	27	.54	1.55
25	26	4	85.0	22	.42	1.15
26	19	4	88.5	15	.345	0.9
27	16	5	89.5	11	.265	0.7
28	13	2	92.5	11	.355	0.95
29	17	1	92.0	16	.50	0.89

IV	1	2	3	4	5	6	7	8
	95	61	22.0	34	.505	1.5		
	90	63	23.5	27	.535	1.05		
	95	54	25.5	41	.555	1.65		
	96	52	26.0	44	.60	1.8		
	96	43	30.5	53	.65	2.0		
	93	43	32.0	50	.585	1.75		
	90	32	39.0	58	.61	1.85		
	72	44	42.0	28	.29	0.8		
	84	26	45.0	58	.58	1.7		
	67	39	47.0	28	.29	0.75		
	80	22	49.0	58	.57	1.7		
	67	27	53.0	40	.40	1.1		
	59	23	59.0	36	.375	1.0		
	52	26	61.0	26	.28	0.75		
	52	22	63.0	30	.33	0.9		



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1	2	3	4	5	6	7	8
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16	50	16	67.0	34	.39	1.05
17	39	26	67.5	13	.15	0.45
18	45	11	72.0	34	.42	1.1
19	25	9	83.0	16	.265	0.7

V	1	90	57	26.5	33	.42	1.2
	2	60	32	54.0	28	.29	0.75
	3	52	26	61.0	26	.28	0.75
	4	54	19	63.5	35	.38	1.05
	5	49	11	70.0	38	.455	1.25
	6	42	15	71.5	27	.325	0.9
	7	31	6	81.5	25	.41	1.1
	8	53	9	69.0	44	.515	1.45
	9	36	4	80.0	32	.51	1.45
	10	25	10	82.5	15	.245	0.65
	11	15	7	89.0	8	.18	0.5
	12	58	30	56.0	28	.29	0.8
	13	61	16	61.5	45	.48	1.35
	14	32	22	73.0	10	.12	0.35

VI	1	75	35	45.0	40	.41	1.15
	2	79	30	45.5	49.	.50	1.4
	3	67	27	53.0	40	.405	1.1
	4	63	24	56.5	39	.40	1.1
	5	54	31	57.5	23	.22	0.65
	6	58	26	58.0	32	.33	0.9
	7	56	18	63.0	38	.41	1.15
	8	48	21	65.5	27	.30	0.8
	9	51	12	68.5	39	.455	1.3
	10	33	26	70.5	7	.08	0.25
	11	36	17	73.5	19	.245	0.65
	12	28	18	77.0	10	.13	0.4
	13	27	16	78.5	11	.155	0.45



1	2	3	4	5	6	7	8
	14	30	12	79.0	18	.26	0.8
	15	34	7	79.5	27	.41	1.1
	16	37	4	80.0	33	.52	0.91
	17	26	10	82.0	16	.26	0.50
	18	19	11	85.0	8	.14	0.4
	19	19	4	89.0	15	.35	0.12
VII	1	83	56	30.5	27	.315	0.9
	2	68	43	44.5	25	.26	0.7
	3	58	44	49.0	14	.14	0.4
	4	38	5	78.5	33	.50	1.4
	5	80	32	44.0	48	.49	1.4
	6	19	5	88.0	14	.305	0.8
	7	50	19	65.5	31	.345	0.95
	8	70	18	56.0	52	.53	1.5
	9	69	16	57.5	53	.54	1.55
	10	42	13	72.5	29	.36	1.0
	11	33	7	80.0	26	.40	1.1
	12	48	7	72.5	41	.53	1.5
	13	45	11	72.0	34	.42	1.2
	14	25	5	85.0	20	.375	1.0
	15	66	8	63.0	58	.63	1.9
	16	25	8	83.5	17	.29	0.8
	17	33	6	80.5	27	.43	1.15
	18	58	10	66.0	48	.54	1.55
	19	32	5	81.5	27	.45	1.25
	20	37	10	76.5	27	.37	1.0
	21	56	7	68.5	49	.58	1.7
	22	39	5	78.0	34	.505	1.45



T A B L E 4L

Standard V

Subject: Gujarati

Sub Test No.	Item No.	Upper U %	Lower L %	Difficult value $\frac{100-U+L}{2}$	Validity	Reliability	Discrimination
1	2	3	4	5	6	7	8
I	1	99	85	8	.14	.475	1.4
	2	98	85	8.5	.13	.385	1.1
	3	99	83	9.0	.16	.50	1.5
	4	98	82	10.0	.16	.43	1.2
	5	97	82	10.5	.15	.38	1.05
	6	96	81	11.5	.15	.345	0.95
	7	95	79	13.0	.16	.34	0.95
	8	99	75	13.0	.24	.58	1.75
	9	94	74	16.0	.20	.36	0.95
	10	99	56	17.5	.33	.65	2.0
	11	84	70	23.0	.14	.19	0.5
	12	86	67	23.5	.19	.29	0.7
	13	86	61	26.5	.25	.32	0.9
	14	76	63	30.5	.13	.15	0.45
	15	85	48	33.5	.37	.415	1.15
	16	79	53	34.0	.26	.29	0.8
	17	78	53	34.5	.25	.28	0.75
	18	85	44	35.5	.41	.455	1.2
	19	77	50	36.5	.27	.295	0.8
	20	80	47	36.5	.33	.36	0.95
	21	78	46	38.0	.32	.34	0.95
	22	80	43	38.5	.37	.395	1.05
	23	72	50	39.0	.22	.23	0.65
	24	69	30	50.5	.39	.39	1.05
	25	73	23	52.0	.50	.50	1.4
	26	65	27	54.0	.38	.39	1.05
	27	42	26	66.0	.16	.18	1.05
	28	50	13	68.5	.37	.425	1.15
	29	37	16	73.5	.21	.27	0.7



1	2	3	4	5	6	7	8
II	1	99	81	10.0	18	.52	1.6
	2	97	76	13.5	21	.45	1.2
	3	91	80	14.5	11	.205	0.5
	4	93	70	18.5	23	.375	0.9
	5	93	66	20.5	27	.41	1.0
	6	90	59	25.5	31	.405	1.1
	7	85	62	26.5	23	.295	0.4
	8	79	58	31.5	21	.245	0.6
	9	85	46	34.5	39	.435	1.2
	10	77	51	36.0	26	.29	0.8
	11	72	46	41.0	26	.27	0.7
	12	77	41	41.0	36	.375	1.05
	13	75	42	41.5	33	.345	0.9
	14	72	44	42.0	28	.29	0.6
	15	75	39	43.0	36	.37	1.0
	16	72	38	45.0	34	.35	0.9
	17	62	46	46.0	16	.16	0.45
	18	63	36	50.5	27	.28	0.75
	19	53	37	55.0	16	.17	0.5
	20	55	31	57.0	24	.25	0.7
	21	51	35	57.0	16	.16	0.4
	22	54	29	58.5	25	.26	0.65
III	1	80	32	44.0	48	.49	1.4
	2	74	36	45.0	38	.39	1.1
	3	74	34	46.0	40	.41	1.1
	4	73	32	47.5	41	.41	1.25
	5	70	30	50.0	40	.40	1.1
	6	65	20	57.5	45	.465	1.3
	7	62	19	59.5	43	.455	1.25
	8	56	17	63.5	39	.425	1.15
	9	32	19	74.5	13	.165	0.4
	10	32	14	77.0	18	.25	0.6



1	2	3	4	5	6	7	8	
	11	34	6	80	28	.44	1.2	
	12	32	2	83	30	.56	1.6	
	13	24	6	85	18	.33	0.8	
	14	22	5	86.5	17	.345	0.9	
	15	22	2	88.0	20	.48	1.3	
	16	18	4	89.0	14	.33	0.8	
	17	19	1	90.0	18	.52	1.5	
	18							
IV	1	90	45	32.5	45	.52	1.5	
	2	80	46	37.0	34	.37	1.0	
	3	89	36	37.5	53	.565	1.6	
	4	77	38	42.5	39	.405	1.1	
	5	67	35	49.0	32	.33	0.8	
	6	61	29	55.0	32	.33	0.9	
	7	51	31	59.0	20	.21	0.6	
	8	48	33	59.5	15	.16	0.45	
	9	47	29	62.0	18	.19	0.5	
	10	48	27	62.5	21	.225	0.5	
	11	42	22	68.0	20	.23	0.6	
	12	50	13	68.5	37	.435	1.2	
	13	43	15	71.0	28	.335	0.9	
	14	23	11	83.0	12	.205	0.5	
	15							
V	1	81	33	43.0	48	.49	1.4	
	2	79	32	44.5	47	.48	1.25	
	3	74	28	49.0	56	.46	1.2	
	4	76	19	52.5	57	.57	1.6	
	5	39	3	79.0	36	.585	1.7	
	6	38	3	79.5	35	.57	1.6	
	7	29	12	79.5	17	.25	0.7	
	8	35	2	81.5	33	.585	1.7	
	9	5	2	96.5	3	.155	0.5	



1	2	3	4	5	6	7	8
VI							
1	98	64	19.0	34	.59	1.8	
2	89	43	29.5	55	.715	2.3	
3	99	39	31.0	60	.775	2.7	
4	94	43	31.5	51	.605	1.8	
5	92	43	32.5	49	.57	1.55	
6	95	38	33.5	57	.66	2.05	
7	93	39	34.0	54	.615	1.85	
8	97	35	34.0	52	.72	2.35	
9	93	38	34.5	55	.62	1.85	
10	88	36	38.0	52	.55	1.6	
11	99	24	38.5	75	.83	3.1	
12	92	29	39.5	63	.655	2.9	
13	88	31	40.5	57	.59	1.75	
14	85	34	40.5	51	.53	1.55	
15	89	29	41.0	64	.62	1.85	
16	91	27	41.0	64	.66	2.05	
17	90	27	41.5	63	.645	1.95	
18	19 87	27	42.0	62	.63	1.95	
19	80	36	42.0	44	.46	1.25	
20	81	32	43.5	49	.50	1.45	
21	89	20	45.5	69	.685	2.15	
22	75	30	47.5	45	.45	1.45	
23	79	26	47.5	53	.53	1.5	
24	81	18	50.5	63	.62	1.85	
25	77	70	53.0	60	.595	1.75	
26	63	28	54.5	35	.36	0.95	
27	64	28	54.0	36	.37	1.0	
28	69	21	55.0	48	.49	1.35	
29	65	24	55.5	41	.42	1.15	
30	54	30	58.0	25	.25	0.65	
31	63	18	59.5	45	.475	1.3	
32	71	10	59.5	61	.635	1.9	



1	2	3	4	5	6	7	8
	33	40	22	69.0	19	.21	0.55
	34	45	14	70.5	31	.37	1.0
	35	38	17	72.5	21	.265	0.65
VII	1	97	72	15.5	20	.485	1.9
	2	97	61	21.0	36	.535	1.7
	3	96	50	27.0	46	.61	1.85
	4	94	50	28.0	44	.56	1.65
	5	95	49	28.0	46	.59	1.75
	6	87	46	33.5	41	.465	1.3
	7	70	23	53.5	47	.475	1.3
	8	58	15	63.5	43	.465	1.3
VIII	1	90	26	42.0	64	.65	2.05
	2	91	23	43.0	68	.685	2.15
	3	75	31	47.0	44	.44	1.25
	4	72	26	50.5	46	.46	1.3
	5	71	26	51.5	45	.45	1.25
	6	68	26	53.0	42	.42	1.15
	7	58	35	53.5	23	.235	0.65
	8	61	32	53.5	29	.30	0.8
	9	62	29	54.5	33	.33	0.9
	10	63	28	54.5	35	.36	0.95
	11	60	28	56.0	32	.32	0.9
	12	71	17	56.0	54	.55	1.55
	13	68	19	56.5	49	.50	1.4
	14	66	20	57.0	46	.47	1.3
	15	70	16	57.0	54	.55	1.55
	16	59	21	60.0	38	.40	1.1
	17	60	15	62.5	45	.485	1.35
	18	58	14	64.0	44	.48	1.35
	19	56	15	64.5	41	.455	1.25
	20	62	8	65.0	44	.60	1.7



1	2	3	4	5	6	7	8
21	53	16	65.5	37	.41	1.1	
22	60	9	65.5	51	.575	1.65	
23	48	19	66.5	29	.325	0.85	
24	50	17	66.5	33	.375	1.0	
25	53	14	66.5	39	.44	1.2	
26	51	14	67.5	37	.425	1.15	
27	54	9	68.5	45	.53	1.45	
28	49	9	71.0	40	.495	1.35	
29	41	14	71.0	30	.36	0.95	

T A B L E 92

Standard V

Subject: Hindi

Sub Test No.	Item No.	Upper U %	Lower L %	Difficult Value 100- $\frac{U}{2}$ -L	Vali- dity U-L	Relia- bility V-U-L	Discrimi- nation	
							6	7
1	2	3	4	5	6	7	8	
I	1	97	58	22.5	39	.595	1.75	
	2	96	58	23.0	38	.56	1.65	
	3	95	50	27.5	45	.565	1.75	
	4	86	41	36.5	45	.49	1.4	
	5	87	39	37.0	48	.515	1.5	
	6	94	29	38.5	65	.69	2.175	
	7	87	31	41.0	56	.575	1.675	
	8	88	29	41.5	59	.605	1.775	
	9	83	34	41.5	49	.505	1.45	
	10	77	34	44.5	43	.44	1.25	
	11	69	42	44.5	27	.28	0.75	
	12	65	43	46.0	22	.22	0.6	
	13	77	30	46.5	47	.475	1.35	
	14	81	26	46.5	55	.55	1.6	
	15	77	24	49.5	53	.53	1.55	



1	2	3	4	5	6	7	8
16	83	19	49.0	64	.63	1.9	
17	74	27	49.5	47	.47	1.35	
18	74	26	50.0	48	.48	1.375	
19	75	24	50.5	51	.51	1.45	
20	74	25	50.5	49	.49	1.4	
21	80	19	50.5	61	.605	1.775	
22	72	25	51.5	47	.47	1.35	
23	78	17	52.5	61	.605	1.775	
24	68	20	56.0	48	.49	1.375	
25	61	27	56.0	34	.35	0.95	
26	50	25	62.5	25	.27	0.725	
27	63	6	65.5	57	.645	1.95	
28	47	12	70.5	35	.42	1.175	
29	44	14	71.0	30	.36	0.975	
30	26	6	84.0	20	.36	0.95	
II	1	96	72	16.0	24	.44	1.3
2	95	69	18.0	26	.44	1.225	
3	94	63	21.5	31	.46	1.3	
4	87	68	22.5	19	.265	0.70	
5	88	65	23.5	23	1.31	0.85	
6	92	56	26.0	36	.47	1.35	
7	93	52	27.5	41	.53	1.5	
8	82	57	30.5	25	.29	0.8	
9	90	46	32.0	44	.51	1.45	
10	91	35	37.0	56	.605	1.775	
11	87	27	43.0	60	.605	1.775	
12	67	36	48.5	31	.32	0.85	
13	75	19	53.0	56	.56	1.6	
14	63	13	62.0	50	.53	1.525	
15	44	15	70.5	29	.335	0.9	
16	46	12	71.0	34	.41	1.1	



1	2	3	4	5	6	7	8	
	17	41	12	73.5	29	.37	1.0	
	18	38	8	77.0	30	.42	1.15	
III	1	83	62	27.5	21	.265	0.7	
	2	79	59	31.0	20	.235	0.65	
	3	84	53	31.5	31	.36	0.975	
	4	67	41	46.0	26	.27	0.7	
	5	72	34	47.0	38	.39	1.5	
	6	60	39	50.5	21	.215	0.575	
	7	56	37	53.5	19	.195	0.55	
	8	57	26	53.5	41	.415	1.15	
	9	57	34	54.5	23	.24	0.65	
	10	53	36	55.5	17	.18	0.5	
	11	58	27	57.5	31	.32	0.875	
	12	49	30	60.5	19	.20	0.55	
	13	46	27	63.5	19	.205	0.55	
	14	58	15	63.5	43	.465	1.3	
	15	45	23	66.0	22	.245	0.65	
	16	42	24	67.0	18	.20	0.55	
	17	46	19	67.5	27	.305	0.85	
	18	30	13	78.5	17	.24	0.6	
IV	1	97	49	27.0	48	.65	2.0	
	2	86	56	29.0	30	.36	1.0	
	3	86	50	32.0	36	.42	1.15	
	4	82	50	34.0	32	.36	1.0	
	5	81	51	34.0	30	.335	0.9	
	6	87	38	37.5	49	.525	1.525	
	7	79	45	38.0	34	.365	0.975	
	8	86	35	39.5	51	.535	1.55	
	9	52	41	53.5	11	.11	0.3	
	10	60	31	54.5	29	.30	0.8	



1	2	3	4	5	6	7	8
V	1	99	92	4.5	7	.35	1.1
	2	99	78	11.5	21	.55	1.675
	3	95	79	13.0	16	.335	0.95
	4	97	76	13.5	21	.45	1.25
	5	93	43	32.0	50	.59	1.7
	6	81	42	38.5	39	.415	1.15
	7	72	36	46.0	36	.37	1.0
	8	81	25	47.0	56	.56	1.65
	9	77	24	49.5	53	.53	1.525
	10	63	11	63.0	52	.555	1.6
	11	41	13	73.0	28	.35	0.9
	12	31	10	79.5	21	.31	0.8
	13	34	1	82.5	33	.65	1.95
	14	33	2	82.5	31	.57	1.625
	15	25	5	85.0	20	.38	1.0
VI	1	96	48	28.0	48	.62	1.9
	2	98	39	31.5	59	.73	2.4
	3	96	34	35.0	62	.70	2.225
	4	96	33	35.5	63	.705	2.25
	5	90	31	39.5	59	.62	1.875
	6	98	26	38.0	72	.79	2.8
	7	78	45	38.5	33	.35	0.95
	8	88	36	38.0	52	.55	1.6
	9	86	37	38.5	49	.52	1.5
	10	93	21	43.0	72	.72	2.85
	11	82	26	46.0	56	.56	1.65
	12	82	25	46.5	57	.57	1.725
	13	87	20	46.5	67	.66	2.0
	14	77	21	51.0	56	.56	1.6
	15	74	23	51.5	51	.51	1.45
	16	59	26	52.5	33	.34	0.925
	17	61	24	57.5	37	.38	1.05



1	2	3	4	5	6	7	8
	18	68	15	58.5	53	.545	1.55
	197	70	15	57.5	55	.56	1.6
	20	33	15	76.0	18	.245	0.6
VII	1	83	19	49.0	64	.63	1.9
	2	65	17	59.0	48	.495	1.4
	3	59	17	62.0	42	.45	1.2
	4	40	14	73.0	26	.33	0.9
	5	37	1	81.0	36	.675	2.0
	6	28	4	84.0	24	.44	1.2
	7	40	5	77.5	35	.51	1.45
	8	31	5	82.0	26	.44	1.2
	9						
VIII	1	92	27	40.5	65	.67	2.5
	2	90	20	45.0	70	.70	2.25
	3	86	18	48.0	68	.67	2.0
	4	72	26	51.0	46	.46	1.3
	5	78	10	56.0	68	.68	2.1
	6	70	15	57.5	55	.56	1.6
	7	59	12	64.5	47	.515	1.45
	8	59	10	65.5	49	.55	1.575
	9	62	7	65.5	55	.67	1.85
	10	48	15	68.6	33.5	.385	1.0
	11	55	6	69.5	49	.595	1.75
	12	45	9	73.0	34	.46	1.25
	13	29	1	85.0	28	.615	1.85
	14	22	3	87.5	19	.43	1.1
	15	19	1	90.0	18	.52	1.5
	16	11	2	93.5	9	.32	0.85



TABLE 93

Standard V

Subject: Arithmetic

Sub Test No.	Item No.	Upper U %	Lower L %	Difficult Value 100-U L 2	Validty V-U-L	Relia- bility	Discrimination
I	1	92	60	24.0	32	.44	1.25
	2	86	58	28.0	28	.34	0.95
	3	77	67	28.0	10	.125	0.45
	4	69	52	39.5	17	.18	0.5
	5	68	37	47.5	31	.32	0.85
	6	56	42	51.0	14	.14	0.4
	7	57	40	51.5	17	.17	0.45
	8	56	33	55.5	23	.24	0.65
	9	51	26	61.5	25	.27	0.75
II	1	72	16	56.0	56	.57	1.65
	2	72	16	56.0	56	.57	1.65
	3	62	20	59.0	42	.44	1.2
	4	64	17	59.5	47	.49	1.35
	5	60	19	60.5	41	.435	1.15
	6	54	18	64.0	36	.39	1.05
	7	54	12	67.0	42	.48	1.35
	8	51	11	69.0	40	.475	1.3
	9	53	8	69.5	45	.54	1.55
	10	51	5	72.0	46	.60	1.8
	11	48	5	73.5	43	.575	1.6
	12	38	1	80.5	37	.67	2.05
	13	25	8	83.5	17	.29	1.60
	14	25	1	87.0	24	.58	1.65
	15	24	2	87.0	22	.50	1.4
	16	6	1	96.5	5	.30	0.8
	17	4	1	97.5	3	.23	0.55



		1	2	3	4	5	6	7	8
III	1	60		44	48.0	16	.16	0.45	
	2	71		23	53.0	48	.485	1.35	
	3	61		17	61.0	44	.47	1.3	
	4	54		15	65.5	39	.435	1.2	
	5	42		19	69.5	23	.27	0.7	
	6	35		20	72.5	15	.18	0.5	
	7	42		13	72.5	29	.36	0.95	
	8	34		11	77.5	23	.32	0.85	
	9	36		8	78.0	28	.40	1.1	
	10	28		13	79.5	15	.22	0.55	
	11	30		10	80.0	20	.30	0.80	
IV	1	59		17	62.0	42	.45	1.25	
	2	65		17	59.0	48	.50	1.4	
	3	67		15	59.0	52	.54	1.55	
	4	79		31	45.0	48	.49	1.35	
	5	57		5	69.0	52	.635	1.6	
	6	45		9	73.0	36	.465	1.25	
	7	62		12	63.0	50	.54	1.55	
	8	39		8	76.5	31	.43	1.2	
	9	33		10	78.5	23	.33	0.9	
	10	37		7	78.0	30	.435	1.2	
	11	17		8	87.5	9	.185	0.45	
	12	30		12	79.0	18	.26	0.6	
	13	32		4	82.0	28	.48	1.3	
V	1	38		8	77.0	30	.32	1.15	
	2	37		3	80.0	34	.56	1.6	
	3	30		6	82.0	24	.40	1.05	
	4	20		7	86.5	13	.26	0.7	
	5	75		5	90.0	10	.24	0.65	
	6	11		2	93.5	9	.32	0.85	



1	2	3	4	5	6	7	8
VI	1	17	1	91.0	16	.50	1.4
	2	11	2	93.5	9	.32	0.9
	3	83	29	44.0	54	.54	1.55
	4	41	12	73.5	29	.37	1.0
	5	19	1	90.0	18	.52	1.45
	6	32	10	79.0	22	.32	0.8
	7	55	25	60.0	30	.32	0.95
	8	8	1	95.5	7	.35	0.95
	9	31	4	82.5	27	.47	1.3
	10	24	4	86.0	20	.40	1.0
	11	47	3	75.0	44	.625	1.65
	12	53	4	71.5	49	.625	1.9
	13	18	3	89.5	15	.38	0.95
	14	9	1	95.0	8	.375	1.0
	15	46	3	75.5	43	.62	1.8
	16	9	1	95.0	8	.37	1.0
VII	1	67	8	62.5	59	.635	1.9
	2	73	6	60.5	67	.705	2.25
	3	64	4	66.0	60	.69	2.15
	4	69	9	61.0	60	.63	1.9
	5	64	1	67.5	63	.78	2.75
	6	65	4	65.5	61	.695	2.05
	7	17	1	91.0	16	.50	1.4
	8	62	6	66.0	56	.64	1.95
	9	58	1	70.5	57	.76	2.55
	10	45	1	77.0	44	.705	2.25
	11	22	2	88.0	20	.48	1.35
	12	10	1	94.5	9	.40	1.1
	13	56	5	69.5	51	.62	1.85
	14	59	7	67.0	52	.60	1.75
	15	59	10	65.5	49	.55	1.55
	16	27	9	72.0	18	.29	0.8
	17	20	7	86.5	13	.26	0.65
	18	18	2	90.0	16	.43	1.15



T A B L E 94

Standard V

Subject: History

Sub Test No.	Item No.	Upper U %	Lower L %	Difficult Value 100- <u><math>\frac{U+L}{2}</math></u>	Validity V <sub>U-L</sub>	Relia- bility	Discrimination
1	1	91	82	13.5	9	.175	0.5
	2	94	66	20.0	28	.44	1.25
	3	93	65	21.0	28	.41	1.2
	4	77	71	26.0	6	.8	0.25
	5	86	61	26.5	25	.32	0.9
	6	76	63	30.5	1.3	.15	0.45
	7	78	53	34.5	25	.28	0.75
	8	68	40	46.0	28	.29	0.75
	9	66	39	47.5	27	.28	0.75
	10	62	46	46.0	16	.16	0.45
	11	59	43	49.0	16	.16	0.45
	12	63	37	50.0	26	.25	0.7
	13	54	43	51.5	11	.11	0.35
	14	74	24	51.0	50	.50	1.45
	15	73	23	52.0	50	.50	1.4
	16	65	27	54.0	38	.39	1.05
	17	58	33	54.5	25	.26	0.7
	18	69	21	55.0	48	.49	1.35
	19	65	24	55.5	41	.42	1.15
	20	50	58	56.0	12	.13	0.35
	21	61	25	57.0	36	.37	1.0
	22	48	34	59.0	14	.15	0.4
	23	66	16	59.0	50	.52	1.95
	24	63	18	59.5	45	.47	1.3
	25	49	22	64.5	27	.30	0.80
	26	55	12	66.5	43	.485	1.35
	27	37	19	72.0	18	.235	0.60
	28	38	17	72.5	21	.265	0.70



1	2	3	4	5	6	7	8
II	1	86	28	43.0	58	.59	1.75
	2	86	23	45.5	63	.625	1.9
	3	63	18	59.5	45	.47	1.3
	4	55	2	71.5	53	.705	2.2
	5	43	12	72.5	31	.385	1.5
	6	47	5	74.0	42	.575	1.6
	7	43	8	74.5	35	.46	1.3
	8	44	4	76.0	40	.57	1.65
	9	47	1	76.0	46	.715	2.25
	10	38	8	77.0	30	.42	1.15
	11	28	13	79.5	15	.22	0.55
	12	39	2	79.5	37	.615	1.8
	13	24	7	84.5	17	.305	0.8
	14	25	2	86.5	23	.505	1.4
	15	19	4	88.5	15	.345	0.85
	16	18	3	89.5	15	.38	0.95
	17	21	1	89.0	20	.54	1.55
	18	18	1	90.5	17	.51	1.4
	19	7	1	96.0	6	.325	0.8
	20	3	1	98.0	2	.17	0.95
III	1	77	70	53.0	60	.59	1.75
	2	66	23	55.5	43	.44	1.2
	3	53	26	60.5	27	.29	0.8
	4	46	18	68.0	28	.32	0.85
	5	49	9	71.0	40	.49	1.35
	6	28	26	73.0	2	.62	0.1
	7	35	8	77.5	27	.39	1.05
	8	32	12	78.0	20	.28	0.7
	9	37	3	80.0	34	.56	1.6
	10	29	9	81.0	20	.315	0.8
	11	25	7	84.0	18	.375	0.9



	1	2	3	4	5	6	7	8
	12	14	8	89.0	6	.13	0.35	
	13	8	4	94.0	4	.14	0.3	
	14	7	4	94.9	3	.11	0.2	
IV	1	16	9	87.5	5	.145	0.35	
	2	39	17	72.0	22	.28	0.7	
	3	39	10	75.5	29	.39	1.05	
	4	34	10	78.0	24	.34	0.85	
	5	29	9	81.0	20	.315	0.8	
	6	20	7	86.5	13	.26	0.7	
	7	20	6	87.5	15	.32	0.85	
	8	11	2	93.5	9	.32	0.85	
	9							
V	1	93	61	23.0	32	.445	1.3	
	2	46	35	59.5	11	.12	0.95	
	3	54	21	62.5	33	.35	0.95	
	4	60	7	66.5	53	.605	1.8	
	5	51	10	60.5	41	.49	1.35	
	6	53	2	72.5	51	.605	1.75	
	7	44	3	76.5	41	.605	1.75	
	8	38	3	79.5	35	.57	1.6	
	9	34	6	80.0	28	.44	1.15	
	10	21	6	86.5	15	.30	0.75	
	11	16	6	89.0	10	.23	0.55	
	12	19	4	89.5	15	.345	0.85	
	13	13	4	91.5	9	.245	0.75	
	14	8	2	95.0	6	.25	0.6	
	15	9	1	95.0	8	.375	0.95	
VI	1	89	79	16.0	10	.165	0.5	
	2	96	53	25.5	43	.59	1.75	
	3	85	65	25.0	20	.265	0.7	
	4	35	65	30.0	30	.355	0.95	



1	2	3	4	5	6	7	8
	5	92	44	32.0	48	.56	1.6
	6	81	32	43.5	99	.50	1.45
	7	83	29	44.0	54	.54	1.55
	8	77	31	46.0	46	.465	1.3
	9	67	36	48.5	31	.32	0.85
	10	69	29	51.0	40	.40	1.1
	11	74	21	52.5	53	.53	1.5
	12	63	31	53.0	32	.33	0.9
	13	61	33	53.0	28	.29	0.75
	14	56	37	53.5	19	.195	0.55
	15	53	37	55.0	16	.17	0.45
	16	58	31	55.5	27	.28	0.75
	17	56	32	56.0	24	.25	0.7
	18	53	33	57.0	20	.21	0.55
	19	61	22	58.5	39	.41	1.1
	20	47	18	67.5	29	.33	0.85
	21	33	29	69.0	4	.4	0.15
	22	40	20	70.0	20	.20	0.0
	23	43	11	73.0	32	.41	1.1
	24	28	2	85.0	26	.53	1.5
	25	16	4	90.0	12	.30	0.7
VII	1	76	39	42.5	37	.38	1.05
	2	81	28	45.5	53	.53	1.55
	3	69	20	55.5	49	.50	1.2
	4	64	24	56.0	40	.41	1.1
	5	58	22	60.0	36	.38	1.0
	6	51	24	62.5	27	.29	0.75
	7	49	23	64.0	26	.285	0.75
	8	58	10	66.0	48	.54	1.5
	9	35	21	72.0	14	.195	0.45
	10	41	13	73.0	28	.355	0.95
	11	40	11	74.5	29	.38	1.0



1	2	3	4	5	6	7	8
	12	35	14	75.5	21	.28	0.7
	13	27	14	79.5	13	.19	0.45
VIII	1	75	26	49.5	49	.49	1.4
	2	83	26	45.5	57	.57	1.65
	3	71	20	54.5	51	.515	1.45
	4	55	21	62.0	35	.365	0.95
	5	27	20	76.5	7	.95	0.25
	6	33	10	78.5	23	.33	0.9
	7	30	10	80.0	20	.30	0.75
	8	28	10	81.0	18	.28	0.65
	9	31	5	82.0	26	.44	1.2
	10	30	6	82.0	24	.40	1.05
	11	24	11	82.5	13	.27	0.5
	12	23	11	83.0	12	.195	0.5
	13	23	5	86.0	18	.355	0.95

\* \* \* \* \*  
TABLE 25

Standard : V		Subject: Geography						
Sub-Test No.	Item No.	Upper U %	Lower L %	Difficulty value $\frac{100 - U + I}{2}$	Validity V <sub>U+I</sub>	Relia- bility	Discrimination	
1	2	3	4	5	6	7	8	
I	1	96	78	13.0	18	.38	1.5	
	2	97	69	17.0	28	.51	1.5	
	3	96	67	18.5	29	.485	1.4	
	4	94	65	20.5	29	.445	1.25	
	5	87	60	26.5	27	.345	0.95	
	6	94	42	32.0	52	.45	1.80	
	7	85	51	32.0	34	.395	1.50	
	8	76	51	36.5	25	.27	0.7	
	9	73	49	39.0	24	.25	0.7	
	10	70	45	42.5	25	.36	0.7	



1	2	3	4	5	6	7	8
	11	78	34	44.0	44	.45	.73
	12	78	35	44.0	43	.44	.85
	13	65	45	45.0	20	.21	.49
	14	72	37	45.5	35	.36	0.95
	15	71	39	45.0	32	.34	0.49
	16	60	46	47.0	14	.14	0.44
	17	77	25	49.0	52	.52	1.10
	18	71	30	50.0	41	.41	0.78
	19	68	31	50.5	37	.375	1.0
	20	68	31	50.5	37	.375	1.0
	21	58	41	51.0	17	.17	0.36
	22	88	10	51.0	78	.76	0.50
	23	60	38	52.0	22	.22	0.55
	24	78	15	54.0	63	.62	1.32
	25	53	33	57.0	20	.25	0.49
	26	54	30	58.0	24	.25	0.65
	27	43	29	64.0	14	.15	0.4
	28	63	10	64.0	53	.58	0.95
	29	58	10	65.0	48	.54	0.93
	30	45	24	66.0	21	.25	0.31
	31	58	7	66.5	49	.56	1.55
II	1	97	74	14.5	23	.47	1.3
	2	85	42	36.5	43	.465	1.3
	3	93	29	39.0	64	.670	2.0
	4	84	37	39.5	47	.495	1.4
	5	78	40	41.0	38	.40	1.5
	6	85	28	43.5	57	.58	1.7
	7	80	24	48.0	56	.56	1.6
	8	65	38	49.0	27	.28	0.51
	9	77	25	49.0	52	.52	1.46
	10	72	28	50.0	44	.44	0.68
	11	69	27	52.0	42	.42	0.72



1	2	3	4	5	6	7	8
12	71	24	53.0	47	.47	0.90	
13	65	27	54.0	38	.39	0.75	
14	68	22	55.0	46	.47	1.3	
15	35	7	79.0	28	.42	1.1	
16	39	3	79.0	36	.57	1.6	
17	38	3	79.5	35	.57	1.6	
18	36	4	80.0	32	.51	1.4	
19	32	7	80.5	25	.395	1.5	
20	35	3	81.0	32	.56	1.5	
22	30	4	83.0	26	.46	1.25	
23	18	3	89.5	15	.38	0.90	
24	11	2	93.5	9	.32	0.90	
25	10	1	94.5	9	.40	1.5	
26	10	1	94.5	2	.40	1.5	
<hr/>							
III	7	.	10.5	21	.54	1.5	
2	94	78	14.0	16	.31	0.85	
3	91	66	21.5	25	.36	1.00	
4	88	36	38.0	52	.55	1.60	
5	87	33	40.0	54	.555	1.60	
6	92	28	40.0	64	.66	2.5	
7	82	22	48.0	60	.60	1.75	
8	75	17	54.0	58	.50	1.70	
9	65	22	56.5	43	.44	1.2	
10	46	5	74.5	11	.45	1.55	
11	70	.	79.0	36	.58	1.6	
12	29	6	82.5	23	.39	1.0	
13	19	5	88.0	14	.30	0.8	
14	21	1	89.0	20	.54	1.55	
15	17	2	90.5	15	.415	1.1	
16	13	5	91.0	8	.210	0.5	
17	16	1	91.5	15	.49	1.35	
18	6	2	96.0	4	.19	0.45	



		1	2	3	4	5	6	7	8
IV	1	96	70	17	26	•46	1.3		
	2	90	58	26	32	•41	1.1		
	3	82	53	32.5	29	•33	0.9		
	4	77	55	34	22	•25	0.65		
	5	80	44	38	36	•39	1.00		
	6	81	40	39.5	41	•435	1.2		
	7	74	43	41.5	31	•325	0.85		
	8	78	40	41.0	38	•40	1.5		
	9	70	45	42.5	25	•26	0.7		
	10	72	38	45.0	34	•35	0.9		
	11	62	46	46.0	16	•16	0.45		
	12	60	46	47.0	14	•14	0.44		
	13	58	42	50.0	16	•42	•45		
	14	68	29	51.5	39	•39	1.5		
	15	53	37	55.0	16	•17	0.5		
	16	55	31	57.0	24	•25	0.7		
	17	65	20	57.5	45	•46	1.3		
	18	54	29	58.5	25	•26	0.65		
	19	62	19	59.5	43	•455	1.25		
	20	58	23	59.5	35	•37	1.0		
	21	58	17	62.5	41	•44	1.2		
	22	49	26	62.5	23	•25	0.65		
	23	45	15	70.0	30	•35	0.9		
	24	46	8	73.0	38	•49	1.4		
V	1	93	52	27.5	41	•53	1.5		
	2	83	53	32.0	30	•34	0.9		
	3	82	47	35.5	35	•385	1.0		
	4	84	39	38.5	45	•48	1.35		
	5	72	46	41.0	26	•27	0.7		
	6	75	42	41.5	33	•345	0.9		
	7	78	36	43.0	42	•43	1.2		



1	2	3	4	5	6	7	8
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8	72	38	45.0	34	.35	0.9
9	71	37	46.0	36	.35	0.9
10	74	34	46.0	40	.41	1.1
11	63	36	50.5	27	.28	0.75
12	67	27	53.0	40	.40	1.1
13	61	29	55.0	32	.33	0.9
14	48	33	59.5	15	.16	0.45
15	53	25	61.0	28	.30	0.8

TABLE 96

Standard V

Subject: Science

Sub-test No.	Item No.	Upper U %	Lower L %	Difficulty value $\frac{100-U-L}{2}$	Validity V-U-L	Reliability.	Discrimination
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1	2	3	4	5	6	7	8
I	1	100	94	3.0	6	.30	0.9
	2	99	92	4.5	7	.35	1.1
	3	96	80	12.0	16	.36	1.0
	4	92	79	14.5	12	.24	0.6
	5	96	72	16.0	24	.44	1.3
	6	95	71	17.0	24	.42	1.1
	7	90	67	21.5	23	.33	0.95
	8	87	68	22.5	19	.265	0.70
	9	88	65	23.5	23	.31	0.85
	10	84	59	28.5	25	.305	0.85
	11	93	46	30.5	47	.57	1.65
	12	80	58	31.0	22	.26	0.7
	13	76	60	32.0	16	.18	0.5
	14	76	57	33.5	19	.21	0.6
	15	82	50	34.0	32	.36	1.0
	16	84	48	34.0	36	.40	1.1
	17	73	53	37.0	29	.21	0.6



1	2	3	4	5	6	7	8
18	67	57	38.0	10	.11	0.3	
19	70	48	41.0	22	.23	0.65	
20	69	49	41.0	20	.21	0.55	
21	74	39	43.5	35	.36	1.0	
22	65	43	46.0	22	.225	0.6	
23	67	36	48.5	31	.32	0.85	
24	69	29	51.0	40	.40	1.1	
25	55	41	52.0	14	.14	0.4	
26	60	31	54.5	29	.30	0.8	
27	71	20	54.5	51	.515	1.45	
28	62	26	56.0	36	.37	1.0	
29	56	32	56.0	24	.25	0.7	
30	60	25	57.5	35	.36	1.1	
31	57	24	59.5	33	.35	0.95	
32	51	27	61.0	24	.255	0.7	
33	41	30	64.5	11	.12	0.35	
IT	1	83	29	44.0	54	.54	1.55
	2	81	24	47.0	57	.57	1.65
	3	70	34	48.0	36	.37	1.0
	4	72	26	51.0	46	.46	1.3
	5	61	24	57.5	37	.38	1.05
	6	61	24	57.5	37	.38	1.05
	7	59	25	58.0	34	.35	0.95
	8	70	9	60.5	61	.64	1.95
	9	59	17	62.0	42	.45	1.2
	10	54	21	62.5	33	.355	0.95
	11	54	6	70.0	48	.59	1.7
	12	46	12	71.0	34	.41	1.1
	13	41	12	73.5	29	.37	1.0
	14	39	10	75.5	29	.39	1.05
	15	38	8	77.0	30	.42	1.15
	16	33	10	78.5	23	.33	0.9



1	2	3	4	5	6	7	8
	17	37	3	80.0	34	.56	1.6
	18	31	5	82.0	26	.44	1.2
	19	30	6	82.0	24	.40	1.05
	20	24	11	82.5	13	.21	0.5
	21	20	7	86.5	13	.26	0.7
	22	18	7	87.5	11	.23	0.6
	23	20	5	87.5	15	.32	.85
	24	15	5	90.0	10	.245	.65
	25	19	1	90.0	18	.52	1.45
	26	11	2	93.5	9	.32	.85
III	1	95	48	28.5	47	.595	1.8
	2	92	44	32.0	48	.56	1.6
	3	87	39	37.0	48	.515	1.5
	4	78	45	38.5	33	.35	.95
	5	71	30	44.5	41	.41	1.15
	6	70	20	50.5	41	.41	1.15
	7	62	35	51.5	27	.28	0.75
	8	75	18	53.3	57	.57	1.65
	9	59	17	62.0	42	.45	1.25
	10	33	19	74.0	14	.175	0.45
	11	63	6	65.5	57	.645	1.95
	12	54	14	66.0	40	.45	1.25
	13	52	12	68.0	40	.46	1.3
	14	37	16	73.5	21	.27	0.7
	15	25	16	79.5	9	.13	0.35
	16	25	10	82.5	15	.245	0.65
	17	29	5	83.0	24	.42	1.15
	18	22	2	83.0	20	.48	1.35
	19	22	9	84.5	13	.23	.6
	20	21	4	87.5	17	.37	.95
	21	22	2	88.0	20	.48	1.35
	22	16	3	90.5	13	.35	.9



1	2	3	4	5	6	7	8
	23	17	1	91.0	16	.50	1.4
	24	11	6	91.5	.5	.13	0.35
	25	9	1	95.0	8	.37	1.0
	26	8	1	95.5	7	.35	0.95
IV	1	99	79	11.0	20	.54	1.65
	2	95	58	23.5	37	.53	1.55
	3	87	66	23.5	21	.285	0.8
	4	83	41	38.0	42	.45	1.25
	5	72	52	38.0	20	.21	.6
	6	81	40	39.5	41	.435	1.2
	7	73	46	40.5	27	.285	.75
	8	69	44	43.5	25	.26	.7
	9	69	42	44.5	27	.28	.75
	10	85	20	47.5	65	.64	1.95
	11	64	33	51.5	31	.32	.85
	12	66	31	51.5	35	.36	.95
	13	70	24	53.0	46	.46	1.3
	14	51	35	57.0	16	.17	.45
	15	69	13	59.0	56	.575	1.7
	16	65	17	59.0	48	.495	1.4
	17	55	12	66.5	43	.485	1.4
	18	48	18	67.0	30	.34	.9
	19	46	17	68.5	29	.335	.9
	20	44	19	68.5	25	.285	.8
	21	28	12	80.0	16	.24	.65
	22	22	5	86.5	17	.345	.9
	23	15	10	87.5	5	.10	.3
	24	18	7	87.5	11	.23	.6
V	1	68	20	56.0	48	.49	1.35
	2	65	16	59.5	49	.51	1.45
	3	58	15	63.5	43	.465	1.3
	4	49	18	66.5	31	.35	0.95



1	2	3	4	5	6	7	8
	5	52	14	67.0	38	.43	1.2
	6	47	9	72.0	38	.48	1.2
	7	42	5	76.5	37	.53	1.5
	8	19	3	89.0	16	.395	1.0
	9	17	3	90.0	14	.365	1.0
	10	79	31	45.0	48	.49	1.35
	11	62	17	60.5	45	.48	1.3
	12	27	9	72.0	18	.29	0.8
	13	33	6	80.5	27	.43	1.2
	14	20	7	86.5	13	.26	0.65
	15	18	2	90.0	16	.43	1.15
	16	14	1	92.5	13	.46	1.3
	17	11	3	93.0	8	.265	.65
VI	1	56	32	56.0	24	.25	0.7
	2	46	17	68.5	29	.335	0.9
	3	45	16	69.5	29	.34	0.85
	4	45	13	71.0	32	.385	1.05
	5	44	11	72.5	33	.41	1.1
	6	34	21	72.5	13	.16	.45
	7	38	16	73.0	22	.28	0.7
	8	41	10	74.5	31	.405	1.1
	9	40	9	75.5	31	.42	1.15
	10	35	14	75.5	21	.28	.7
	11	-	17	76.5	-	.175	.45
	12	25	21	77.0	4	.05	.2
	13	34	7	79.5	27	.41	1.1
	14	33	2	82.5	31	.57	1.625
	15	23	10	83.5	13	.22	.55
	16	19	8	86.5	11	.215	.5



1	2	3	4	5	6	7	8
1	89	51	30.0	38	.455	1.3	
2	63	29	54.0	34	.35	0.95	
3	75	36	44.5	39	.40	1.1	
4	86	42	36.0	44	.48	1.35	
5	63	22	57.5	41	.425	1.15	
6	89	48	31.5	41	.48	1.35	
7	67	23	55.0	43	.45	1.25	
8	53	18	64.5	35	.385	1.05	
9	50	31	59.5	19	.20	0.55	
10	65	11	62.0	44	.575	1.65	
11	44	6	75.0	38	.52	1.45	

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#### Item Selection :

Lindquist<sup>1</sup> suggests that the following principles should be observed while selecting the items for the final run.

- (1) A difficulty index should be computed for each item.
- (2) A discrimination index should be computed for each item.
- (3) The number of items desired at each level of difficulty should be estimated.
- (4) All the tryout items should next be separated into groups indicated in the outline of the test. From each separate group, a number of items should be selected tentatively that will be roughly proportional to the weight given to each division in the test outline and that will create approximately the proper distribution of item difficulty indices.
- (5) The entire group of test items should be read over as a unit to detect unnoticed overlappings of choices and to prevent cross-keying of items.

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1. Lindquist E.F., "Educational Measurement" American Council on Education, Washington D.C. 1955. P. 313-315



- (6) The choice-by-choice item analysis data for each item should be studied.
- (7) The items should be grouped approximately arranged in order of difficulty.

In the present experiment, the following points were considered critically at the time of selecting the items.

- (a) The difficulty level.
- (b) The item validity.
- (c) The discriminating Power.
- (d) The distractors of multiple-choice test.
- (e) The curricular validity.

(a) The difficulty Level :

It is a mathematical fact that an item of 50% difficulty level is the most discriminating one. But to prepare all the items of 50% difficulty level is not practically possible. ".....it would be difficult to construct such an examination and it is probable that a test made up of items covering a wider range of difficulty is psychologically a better measuring device."<sup>1</sup> Summer<sup>2</sup> suggests the practical solution in deciding the range.

Item of difficulty range.	Percentage.
From 0 - 40	20%
From 40 - 60	60%
From 60 - 90	20%

On the basis of the above mentioned percentage selection in the present experiment is carried out.

b) The Item Validity :

A good test is that which contains items of high discriminative value. Thorndike suggests, "An item with a validity coefficient as high as 0.25 or 0.30 usually represents an outstanding valid item".<sup>3</sup>

In the present experiment, the above criteria is also carried out.

<sup>1</sup>, Garratt H.E., "Statistics in Psychology and Education." Longmans



{c) The Discriminating Power:

In order to show that the item has significant discriminating power, Ross has given a table showing the value above which an item can be considered sufficiently discriminating for total number of persons tested from group 28-30 to 3701-3705.

As 370 students were tested in each of the 18 tests in the present experiment, an extract from that table<sup>4</sup> is shown in the following table.

T A B L E No. 97

Table for Determining Whether or Not a

Given Test Item Discriminates Signifi-

cantly Between a "High" and a "Low" Group.

Total Number of persons Tested	Number in Low or High Group ( $0.27N$ )	$(W_L - W_H)$ at or above which an item can Be Considered <u>Sufficiently Discriminating.</u>	Number of Options.
N	$N_L = N_H = n$		2      3      4      5
369 - 372	100	(True false or Two option Multi- ple Choice)	13      14      14      15

The items selected in the True-false and Multiple Choice tests for the final run of the 18 tests of the present experiment were such that these values were higher 13 and 14 respectively. For other types of tests, the items of higher values have been selected.

- 2. W. Summer, "Statistics in Education" Basic, Black well & Co., London. P. 180
- 3. Thorndike R.L., "Personnel Selection" Jhon Wiley & Sons, Inc, New York. 1949. P. 245.
- 4. Ross C.C., "Measurement in To-days Schools" Prentice - Hall. Inc. 1956. P. 450.



(d) The Distractors of Multiple-Choice Tests :

It was found that correct responses in several items of the Multiple-Choice tests in the 18 tests of the present experiment were comparatively smaller in some of the distractors.

There were three possibilities in the case of these items.

(1) Such distractors might have attracted all the pupils irrespective of the group U, M and L.

(2) Such distractors might have attracted the pupils of the U group.

(3) Such distractors might have attracted the pupils of the L group.

It is a fact that if the item is discriminative, except the correct responses, the number of distractors in the U group must be less than the number of distractors in the L group.

All the suggested responses of such items including three option items for the U and L groups were calculated. It was found that the number of distractors in the U group was larger than the number of distractors in the L group. Hence the distractors had comparatively attracted the pupils of U group. Such items were negatively discriminative. So they were dropped for the final run. In other cases the pupils of L group were attracted by the distractors. Hence such items were discriminative and so they were put in the run.



selected for the final run.

(e) Curricular Validity :

The test containing the items which satisfy only the statistical requirements, does not fulfill the purpose namely to measure the achievement of pupils in a particular subject for a particular standard. It is obvious that such a test may not cover the whole course giving due weightage to every topic. As discussed in chapter II due weightage should be given to each of the objectives of standards V, VI and VII. Table No. 56 to 73 on pages 50 to 62 show the standard wise specification of contents.

In the present experiment, specification of contents was also considered while selecting the items.

Item selection Technique and the present Experiment :

All the above points regarding item selection are discussed separately. It is not practical to select items keeping the above points separately in view. All these points should be considered simultaneously while selecting the items.

In the present experiment, the following procedure was adopted.

First of all, the statistical data for all the items of all the 18 tests were computed as given in tables 79 to 96. Items of negative discrimination were omitted for final run.

Items with validity index ( $r$ ) less than .25 or discriminative value less than 13 were separated from the list.

All the remaining items with their statistical data were distributed in a table from according to objectives.

Items were then selected for the final run keeping Summer's view regarding the difficulty value and curricular validity simultaneously.



Some of the items were also selected inspite of their low validity (i.e. below .25) on account of their curricular validity.

It can be understood that it is not possible to prepare a test satisfying all the principles at a time.

The following Tables show the distribution of the selected Items according to Topics in each of the Sub-Tests.

Table No. 98

Standard VII		Sub:- Gujarati										
No.	Topics	Total No. of items selected in each of the sub-tests.						Total Per- cent- age.				
		1	2	3	4	5	56	76	8	9	in each of the Topics.	
1. Prose												
2. Poetry	{	40	-	32	-	-	-	10	-	10	98	56.1
3. Rapid Reader	}											
4. Grammer		-	12	-	10	12	-	-	-	-	34	20.7
5. Composition		-	-	-	-	-	25	-	13	-	38	23.2
		40	12	32	10	12	25	10	13	10	164	100.00

Table No. 99

Standard VII		Sub:- Hindi									
No.	Topic	Total No. of items selected in each of the sub-tests.						Total No. of items in each	Per- cent- age.		
		1	2	3	4	5	6	7	8	of the Topics.	
1	Prose	9	-	-	25	-	21	23	-	78	56.9
2.	Poetry										
3.	Grammer	-	-	20	-	-	-	-	-	20	14.6
4	Composi- tion and oral work	-	10	-	-	19	-	-	10	39	28.5
		9	10	20	25	19	21	23	10	137	100.00



We have seen in Chapter II that more than one book was sanctioned as text book by the Education Department of the State and the different books contained different selected prose passages and poems. Again the different schools used different books and hence it was not possible to select items based on actual textual material. However, the test items selected for the Gujarati and the Hindi tests of all the three standards of the present experiment are of such a general nature that any one with sufficient back ground will be able to answer them with ease. At the same time the material selected is such that it has some bearing on one or the other sanctioned text book.

In the test items selected it was rather difficult to decide (for the above mentioned reasons) whether to put a particular item in prose or poetry or a Rapid Reader. To avoid the difficulty all the three topics are combined in all the tables showing the selection of items in Gujarati and Hindi for all the three standards viz. VII, VI and V.



Table No. 100

Standard VII

Sub: Arithmetic

No. Topic

	Total No. Items selected in each of the sub-tests	Total Per- cent						
		1	2	3	4	5	6	7

items	age
in each	of the
	Topics.

1. Simple interest	1	1	-	-	2	-	-	4	6.4	
2. Compound Interest	1	1	-	-	7	-	-	9	14.2	
3. Ratio & Proportion Partnership.	2	3	1	-	-	-	-	5	11	17.4
4. Time, transport and speed, work & wages.	1	-	1	3	2	-	-	7	11.1	
5. House-hold accounts & Family budget.	-	1	-	-	-	-	-	11	12	19.1
6. Scale drawing and finding distance on a map.	-	-	1	-	2	1	-	4	6.4	
7. Demonstration of the property of vertically opposite angles etc.	-	2	1	4	-	-	-	7	11.1	
8. Area of the circle	-	-	1	-	-	3	-	4	6.4	
9. Cubic measure	2	1	1	-	-	1	-	6	7.9	
	7	9	6	7	13	5	16	63	100.0	



Table No. 101

Standard VII

Sub:- History

No.	Topic	Total No. of items selec- cted in each of the sub- tests.								Total No. of items in each of the Topics.	Per- centage.
		1	2	3	4	5	6	7	8		
1.	The Rivalry between the European powers	-	2	2	3	1	-	1	4	13	8.4
2.	The establishment and consolidation of British Rule in India.	4	7	5	3	5	1	2	5	42	27.2
3.	The Indian War of Independence 1857	2	-	-	2	1	1	-	-	6	3.9
4.	Renaissance in India	1	1	3	-	1	1	-	1	8	5.2
5.	Growth of Nationalisation in India	3	1	1	2	-	1	1	1	10	6.4
6.	Birth & Development of the Indian National Congress.	-	-	1	-	1	1	-	-	3	1.9
7.	Mahatma Gandhi's Satyagrah Movement	3	-	5	-	1	-	-	1	10	6.4
8.	The World War and its effects.	6	-	3	1	-	3	1	-	14	9.1
9.	Non-cooperation and Satyagrah movements.	4	2	4	5	-	1	1	-	17	11.0
10.	The First Congress Government in the Provinces.	2	1	-	-	-	-	-	-	3	1.9
11.	World War II	-	-	-	1	2	1	1	-	5	3.2
12.	The Independence of India	2	-	3	1	2	5	2	-	15	9.7
13.	How India is governed now.	3	2	1	3	-	-	-	-	9	5.8
		40	16	28	21	14	15	9	12	155	100.00



Table No. 102

Standard VII

Sub: Geography

No.	Topic	Total No. of items selected in each of the sub tests.							Total No. of cent items in each of the Topics.	Per centage.
		1	2	3	4	5	6	7		
1.	Study of India, w.r.t location, size, relief, climate, rainfall etc.	6	12	6	4	-	-	1	29	21.5
2	India's wealth in water-power, Forest and Sea produce, minerals etc.	8	1	4	4	5	-	-	22	16.3
3.	Imports & Exports	5	-	1	-	-	-	-	6	4.4
4.	Languages of Indian people	-	-	1	-	-	-	-	1	0.8
5.	Australia	1	-	3	1	1	-	-	6	4.4
6.	Great Britain	2	-	1	1	2	-	-	6	4.5
7.	U.S.A.	2	2	-	1	1	-	1	7	5.2
8.	U.S.S.R.	2	1	1	-	-	-	-	4	3.0
9.	South & East Africa	2	1	3	-	-	-	-	6	4.4
10	Altitude & Latitude	6	1	6	-	-	-	-	13	9.6
11	Standard & Local time	1	2	2	-	-	-	-	5	3.7
12	Climate Zones.	2	2	-	-	-	-	4	8	5.9
13	Seasons.	2	1	2	-	-	-	-	5	3.7
14	Out-line map of India	-	-	-	-	-	17	-	17	12.6
		39	23	30	11	9	17	6	135	100.00



Table No. 103

Standard VII

Sub:- Science

No.	Topic.	Total No. of items selected in each of the sub-tests.							Total No. of items in each of the Topics.	Per- cent- age.
		1	2	3	4	5	6	7		
1.	Air	8	9	8	7	4	5	4	45	27.4
2.	Water	5	-	4	1	3	1	-	14	8.5
3.	Food	1	1	2	4	5	5	1	19	11.6
4.	Movement	8	5	4	6	3	-	6	32	19.5
5.	Senses	8	6	2	2	3	1	3	25	15.2
6.	Reproduction	4	2	1	1	3	1	6	18	11.1
7.	Study of the sky	-	3	5	1	1	-	1	11	6.7
		34	26	26	22	22	13	21	164	100.0

The following Tables show the distribution of the selected items according to Topics in each of the sub-tests for Std. VI

Table No. 104

Standard VI

Sub:- Gujarati

No.	Topic	Total No. of items selected in each of the sub-tests.							Total No. of items in each of the Topics.	Per- cent- age
		1	2	3	4	5	6	7		
1.	Prose									
2.	Poetry	25	-	25	25	-	-	-	75	58.33
3.	Rapid Reader									
4.	Grammer	-	10	-	-	a } 5	20	-	43	33.33
						b } 8				
5.	Composition	-	-	-	-	-	-	11	11	8.64
		25	10	25	25	13	20	11	129	100.0



Table No. 105Standard VISub:- Hindi

No.	Topic	Total of items selected in each of the sub-tests.								Total No. of items in each of the Topics.	Per centage.
		1	2	3	4	5	6	7	8		
1.	Prose										
2.	Poetry	30	-	20	18	14	-	-	-	82	64.1
3.	Oral Work										
4.	Grammer	-	10	-	-	-	10	-	-	20	15.6
5.	Composition	-	-	-	-	-	-	8	18	26	20.3
		30	10	20	18	14	10	8	18	128	100.0

Table No. 106Standard VISub:- Arithmetic

No.	Topic	Total No. of items selected in each of the sub-tests.							Total No. of items in each of the Topics.	Per centage.
		1	2	3	4	5	6	7		
1.	Fractions and Decimal Fractions.	3	9	7	7	-	-	-	26	29.5
2.	Percentage	6	3	3	-	3	3	-	18	20.5
3.	Exchange	1	3	1	-	-	-	-	5	5.7
4.	Profit & Loss	-	1	1	2	2	4	-	10	11.4
5.	Angles.	5	2	2	-	3	-	6	18	20.5
6.	Postal and telegraphic information	1	-	3	-	-	-	-	4	4.5
7.	Columns graphs	-	-	-	-	-	7	-	7	7.9
		16	18	17	9	8	14	6	88	100.0



Table No. 107

Standard VI

Sub:- History

No.	Topic	Total No. of items select- ed in each of the sub-tests.							Total Per- centage of items in each of the Topics.
		1	2	3	4	5	6	7	
1.	Political and social condition in India.	2	3	5	3	-	1	1	15 13.2
2.	The advents of the Muslims.	-	1	1	3	2	5	1	12 10.4
3.	The Vijaynagar and Bahmani kingdoms.	3	1	-	3	1	-	1	9 6.6
4.	Establishment of Mogul Power	3	-	-	1	1	-	1	6 5.3
5.	Akbar the great	9	5	3	2	1	-	1	21 18.3
6.	Jahangir, Shahjahan and Aurangjab	2	2	1	2	2	-	2	11 9.6
7.	Rise of Sikhs	3	-	-	-	1	-	1	5 4.3
8.	Religious movements in India.	3	2	1	1	-	-	2	7 6.1
9.	Shivaji the great	3	1	-	1	-	1	1	7 6.1
10.	The First Four Peshwas	8	-	3	4	3	3	1	22 19.1
		36	15	13	20	11	10	10	115 100.00



Table No. 108

Standard VI

Sub:- Geography

No.	Topic	Total No. of items selected in each of the sub-tests.							Total No. of items in each of the topics.	Per centage.
		1	2	3	4	5	6	7		
1.	Detailed study of India.	5	5	6	10	7	18	3	54	39.8
2.	Pakistan	5	-	2	-	2	-	-	9	6.6
3.	Burma	3	-	3	-	1	-	1	8	5.9
4.	Ceylon	7	-	-	-	1	-	2	10	7.3
5.	Indonesia	7	-	-	-	1	-	-	8	5.9
6.	China	5	2	-	2	-	-	2	11	8.1
7.	Japan	2	1	1	3	1	-	-	8	5.9
8.	Shape and size of the earth.	1	2	2	-	-	-	-	5	3.7
9.	Phenomenon of Day and night	3	3	-	-	-	-	-	6	4.4
10.	Monsoon as affecting south-eastern countries of Asia	-	1	2	2	-	-	5	10	7.3
11	Rainfall - evaporation and condensation.	2	4	-	1	-	-	-	7	5.1
		40	18	16	18	13	18	13	136	100.0



Table No. 109Standard VISub:- Science

No.	Topic	Total No. of items selected in each of the sub-tests.							Total No. of items in each of the topics.	Per- cent- age.
		1	2	3	4	5	6	7		
1	Air	8	3	3	3	3	-	-	20	12.35
2	Water.	2	3	3	2	-	-	-	10	6.17
3	Food	5	11	11	4	-	10	6	47	29.01
4	Movement	8	3	6	6	7	4	6	40	24.69
5	Senses	6	4	3	4	4	5	1	27	16.67
6	Study of the sky.	3	3	3	-	-	-	9	18	11.11
		32	27	29	19	14	19	22	162	100.00

The following Tables show the distribution of the selected items according to Topics in each of the sub-tests for Std. V

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Table No. 110Standard VSub:- Gujarati

No.	Topic	Total No. of items selected in each of the sub-tests.							Total No. of items in each of the Topics.	Per- cent- age.	
		1	2	3	4	5	6	7			
1	Prose										
2	Poetry	29	22	17	14	-	35	-	-	117	71.83
3	Rapid Reader										
4	Grammer	-	-	-	-	-	-	-	29	29	17.8
5	Composition	-	-	-	-	9	-	8	-	17	10.4
		29	22	17	14	9	35	8	29	163	100.0



Table No. 111

Standard V	No. Topic	Total of items selected in each of the sub-tests.								Sub:- Hindi
		1	2	3	4	5	6	7	8	
1. Prose										
2. Poetry	}	30	18	18	-	15	-	-	-	81      60.00
3. Oral Work	}									
4. Grammer		-	-	-	10	-	20	-	-	30      22.2
5. Composition		-	-	-	-	-	-	8	16	24      17.8
		30	18	18	10	15	20	8	16	135      100.00

Table No. 112

Standard V	No. Topic	Total No. of items selected in each of the sub-tests.							Sub:- Arithmetic	
		1	2	3	4	5	6	7		
1. Revision of Simple & Compound Rules.										
2. G.C.M. & L.C.M. etc.		2	-	2	-	-	-	12	16      17.7	
3. Fraction		2	5	2	10	-	8	-	27      30.0	
4. Averages		-	3	1	-	-	2	-	6      6.7	
5. Unitary and fractions methods in proportion.		3	3	2	-	-	-	-	8      8.9	
6. Preparing bills and receipts etc.		-	-	-	-	-	-	6	6      6.7	
7. Familiarity with Right Angle, Rectangle		-	1	1	-	-	6	-	8      8.9	
8. Square and rectangle etc.		1	-	-	3	6	-	-	10      11.1	
		9	17	11	13	6	16	18	90	100.00



Table No. 113Standard VSub:- History

No.	Topic	Total No. of items selected in each of the sub-tests.							Total No. of items in each of the Topics.	Per centage.	
		1	2	3	4	5	6	7			
1.	Apana Desh	1	1	2		1	2	1	-	8	5.8
2.	Indus Valley civilisation	2	1	-	-	-	4	-	2	9	6.6
3.	Advent of Aryans	1	-	4	1	-	3	1	3	13	9.5
4.	Bharat after advent of Aryans	6	4	4	1	-	1	1	-	17	11
5.	Bharat before Mahavir	1	-	-	-	-	-	-	2	3	2.2
6.	Mahavir Swami	4	3	-	-	-	2	-	-	9	6.6
7.	Gauttam Buddha	2	2	3	1	4	4	1	1	18	13.1
8.	Alexander the great and Porous	2	2	-	-	2	1	2	1	10	7.3
9.	Chandragupta Maurya	4	3	-	-	1	1	-	-	9	6.6
10.	Ashok the great	1	1	-	1	2	1	1	2	9	6.6
11.	Kaniska the great	2	1	-	-	1	1	1	-	6	4.4
12.	Guptas	2	1	2	1	2	2	1	-	11	8.0
13.	Harsha and Pulkeshin	-	1	-	1	-	1	2	-	5	3.6
14	Travels of Hieusen Tseng	-	-	-	2	2	2	2	2	10	7.3
		28	20	15	8	15	25	13	13	137	100.00



Table No. 114

Standard V

Sub: Geography.

No.	Topic	Total No. of items selected in each of the sub-tests.							Total No. of items in each of the Topics.	Per- cent- age.	
		1	2	3	4	5	6	7			
1.	Study of lives, work and occupation of the people of India.	7	5	7	8	4	13	4	-	48	31.2
2.	Desert of Marwar	2	3	-	1	-	-	-	1	7	4.5
3.	Punjab	2	2	1	1	-	-	1	1	8	5.2
4.	Kashmir	1	-	2	1	1	-	-	-	5	3.3
5.	Ganges	1	3	-	-	-	-	-	-	4	2.6
6.	Bengal	-	-	1	1	2	-	2	-	6	3.9
7.	Assam	-	3	-	-	1	-	1	-	5	3.3
8.	Mysore	2	2	-	-	-	-	1	-	5	3.3
9.	Tamilnad	2	2	1	1	1	1	2	1	11	7.2
10.	Kerala	-	1	1	2	1	-	-	-	5	3.3
11.	Homes and occu- pations of some people.	10	5	5	8	5	-	-	6	39	25.1
12.	Observation of shadow	-	-	-	-	-	-	-	3	3	2.9
13.	Observation of changes in Nature in different seasons.	4	-	-	1	-	-	-	3	8	5.2
		31	26	18	24	15	14	11	15	154	100.00



Table No. 115

No.	Topic	Total No. of items selected in each of the sub-tests.							Total No. of items in each of the topics.	Per- cent- age.
		1	2	3	4	5	6	7		
1.	Air	11	5	7	1	-	2	1	27	17.6
2.	Water	4	3	1	6	9	5	1	29	18.9
3.	Food	2	7	5	4	6	3	-	27	17.7
4.	Movement	1	4	5	3	2	5	7	27	17.7
5.	Senses	10	4	6	7	-	1	2	30	19.6
6.	Study of the sky.	5	3	2	3	-	-	-	13	8.5
		33	26	26	29	17	16	11	153	100.00

Tables show the comparative statement of Topicwise fixation of items and the actual items selected on a hundred point scale for standards VII, VI, V

Table No. 116

Objectives	Standard VII			Standard VI			Sub: Gujarati	
	No. of Items fixed.	No. of items selected.	Standard VII	No. of items fixed.	No. of items selected.	Standard VI	No. of items fixed.	No. of items selected.
1								
2	68.6	56.1	69.6	63.03	68.8	71.8		
3								
4	15.1	20.7	14.8	27.73	14.8	17.8		
5	16.3	23.2	15.6	9.24	16.4	10.4		
	100.0	100.0	100.0	100.00	100.0	100.0		



Table No. 117

Standard VII	<u>Hindi</u>		Sub:- Hindi	
Objectives	Standard VII		Standard VI	Standard V
No.	No. of items fixed.	No. of items selected.	No. of items fixed.	No. of items selected.
1.	60.8	56.9	61.0	64.1
2.				60.7
3.	16.5	14.6	18.3	15.6
4.	22.7	28.5	20.7	20.3
5.				21.3
	100.0	100.00	100.0	100.0
				100.0
				100.0

Table No. 118

Standard V	<u>Arithmetic</u>			
Objectives	Standard VII		Standard VI	Standard V
No.	No. of items fixed.	No. of items selected.	No. of items fixed.	No. of items selected.
1.	57.8	6.4	30.7	29.5
2.	15.7	14.2	16.4	20.5
3.	16.8	17.4	6.0	5.7
4.	13.4	11.1	12.1	11.4
5.	9.2	19.1	21.2	20.5
6.	7.2	6.4	6.6	4.5
7.	11.2	11.1	7.0	7.9
8.	10.4	6.4	-	-
9.	8.3	7.9	-	-
	100.0	100.0	100.0	100.0
				100.0
				100.0



Table No. 119History

Objective No.	Standard VII		Standard VI		Standard V	
	No. of items fixed.	No. of selected.	No. of items fixed.	No. of selected.	No. of items fixed.	No. of selected.
1	10.1	8.4	11.6	13.0	5.8	5.8
2.	18.4	27.1	8.4	10.4	8.2	6.6
3.	4.9	3.9	5.0	7.8	9.0	9.5
4.	6.9	5.2	3.1	5.3	5.0	12.4
5.	6.7	6.4	30.6	18.3	{ 8.7	6.8
6.	8.2	1.9	4.0	9.6		
7.	4.6	6.4	6.4	4.3	6.4	13.1
8.	4.6	9.1	6.8	6.1	6.0	7.3
9.	7.3	11.0	4.5	6.1	10.4	6.6
10.	5.1	1.9	19.6	19.1	7.3	6.6
11.	4.5	3.2	-	-	6.3	4.4
12.	5.4	9.7	-	-	12.3	8.0
13	5.5	5.8	-	-	7.1	3.6
14	7.8	-	-	-	7.5	7.3
	100.0	100.0	100.0	100.0	100.0	100.0



Table No. 120Geography

Objectives No.	Standard VII		Standard VI		Standard V	
	No. of fixed. items	No. of selected. items	No. of fixed. items	No. of selected. items	No. of fixed. items	No. of selected. items
1.	24.9	21.5	43.4	39.8	29.76	31.2
2.	20.0	16.3	6.1	6.6	3.36	4.5
3.	4.3	4.4	5.6	5.9	3.19	5.2
4.	3.7	0.8	5.6	7.3	4.24	3.3
5.	4.9	4.4	5.6	5.9	5.07	2.6
6.	5.5	4.5	7.0	8.1	3.66	3.9
7.	5.2	5.2	6.0	5.9	3.72	3.3
8.	5.4	3.0	5.6	3.7	3.75	3.3
9.	5.4	4.4	4.5	4.4	3.93	7.2
10.	4.8	9.6	5.6	7.3	3.34	3.3
11.	3.9	3.7	5.0	5.1	28.55	25.1
12.	3.7	5.9	-	-	2.83	1.9
13.	3.9	3.7	-	-	4.6	5.2
14.	4.4	12.6	-	-	-	-
	100.0	100.0	100.0	100.0	100.0	100.0



Table No. 121Science

Objectives No.	Standard VII		Standard VI		Standard V		Mean No of items fixed.
	No. of items fixed.	No. of items selected.	No. of items fixed.	No. of items selected.	No. of items fixed.	No. of items selected.	
1.	22.7	27.4	13.7	12.4	21.0	17.6	
2.	10.7	8.5	8.0	6.2	18.8	18.9	
3.	14.1	11.6	28.2	29.0	17.7	17.7	
4.	16.0	19.5	24.0	24.7	15.6	17.7	
5.	15.8	15.2	17.0	16.7	16.4	19.6	
6.	14.4	11.1	9.1	11.0	11.1	8.5	
7.	6.3	6.7	-	-	-	-	
	100.0	100.00	100.00	100.00	100.00	100.00	

Time Limits for the Final Run :

Lindquist suggests that the time-limits in general achievements should be so adjusted that "at least 75 percent of the pupils will have time at least to consider all items in each section"<sup>20</sup> Ruch suggests that time limits should be so fixed that "90 percent can attempt all items within their power".<sup>21</sup> According to Greens, "In achievement testing sufficient time is ordinarily allowed for at least 80 or 90 percent of the pupil to finish. The speed factor does not receive much weight in the resulting scores."<sup>22</sup> According to Ross<sup>23</sup>

1. Ibid. P. 156
2. Ibid. P. 156
3. Greene H.A., Jorgensen A.N. and Gerberich J.R., "Measurement and Evaluation in the Secondary School." Longmans Green and Co., New York. 1955. P. 41
4. Ross C.C., "Measurement in To-day's Schools" Prentice-Hall Inc. 1956. P. 155.



" the time allowance for the test should be generous. Short time allowances should be avoided in order to secure the data needed for determining the difficulty and the discriminating value of the items."

Considering the above views, it was decided to allow liberal time-limits.

The following tables show the time limits fixed for the various tests of this experiment.

Table No. 122

Table showing the time limits of the tests for  
Standard VII

Sub test No.	Subjects						Science
	Gujarati	Hindi	Arithmetic	History	Geography		
1	8	5	6	12	8	7	
2	4	8	7	9	8	11	
3	8	8	7	7	9	10	
4	7	8	7	6	8	10	
5	4	8	11	7	7	8	
6	8	10	10	6	10	8	
7	7	5	12	5	10	6	
8	7	8	-	8	-	-	
9	7	-	-	-	-	-	
	60	60	60	60	60	60	



Table No. 123

Table showing the time limits of the tests  
for Standard VI

Sub Test No.	Subjects					
	Gujarati	Hindi	Arithmetic	History	Geography	Science
1	13	6	10	13	10	8
2	7	4	6	9	9	9
3	14	7	8	7	8	8
4	7	7	9	10	9	11
5	6	7	8	7	7	8
6	8	6	13	7	10	9
7	5	3	6	7	7	7
8	-	20	-	-	-	-
	60	60	60	60	60	60

Table No. 124

Table showing the time limits of the tests  
for Standard V

Sub Test No.	Subjects					
	Gujarati	Hindi	Arithmetic	History	Geography	Science
1	9	7	5	8	10	9
2	6	14	10	9	7	10
3	8	6	7	7	8	8
4	7	2	13	7	9	9
5	8	10	6	7	8	10
6	8	8	8	8	7	9
7	6	7	11	7	5	5
8	8	6	-	7	6	-
	60	60	60	60	60	60



The changes after the pilot testa) Changes in the title page :

It was found that our children were not accustomed with new way of testing. Some children were not serious about answering or even attempting all the items in sub-test. While others completed the work very haphazardly. Hence instructions were made very clear. These instructions are given on the first page of every test given at this end of the report.

b) Changes in the direction of sub-test :-

In the beginning of every test, directions followed by illustration were given in the right of the experience of the pilot testing. These directions were altered a bit. Wherever necessary more than one illustration were also given.

c) Other changes :

A few other changes regarding the use of types form of presentation and layout were also made.

Final printing of the test :

After incorporating all the changes mentioned above, the test were reprinted for the final run.



C H A P T E R VTHE FINAL RUN OF THE TEST

We saw in the last chapter how the test items in the different tests of Standards VII, VI and V were selected and were arranged accordingly to their difficulty value as far as possible. The sub-tests in each of the tests were also re-arranged wherever necessary and were then printed. These tests are given in Appendix.

Administration of the Tests :

To make the Norms reliable, the school population selected for the final run should be such that it might be considered to be a representative sample of the whole population.

To select the representative population, the following consideration were kept in view.

- i) School should be selected at random from the different wards of the City.
- ii) School include schools from the city as well as Suburbs.
- iii) Should include Municipal as well as non-municipal Schools.
- iv) Should include Boys schools, girls schools and Mixed Schools.
- v) Should include children from different social economical and cultural strata of the society dwelling in the city.

The following table shows the names of the schools selected at random for the final run of the tests.



Table No. 125

The names of schools selected at Randum for the final run of the Tests.

No.	Name of the School	Whether Municipal or Non-Municipal.	Whether Boys or Girls.	Location of the School.
1	Vadilal Chatrabhuj	Non-Muni.	Boys	Ghatkopar
2	I.B.Patel Vidyalaya	" "	Boys & Girls	Goregaon
3	Chanda Ramji Girls High School	" "	Girls	C.P.Tank
4	Sardar Vallabhbhai Patel High School	" "	Boys & Girls	Kandivali
5	Fellowship High School	" "	" "	Gowalia Tank
6	H.P.T. High School	" "	Girls	Fort
7	Esplanade High School	" "	Boys & Girls	Fort
8	Sawla High School	" "	" "	Matunga
9	Nutan Kelwani Mandir	" "	" "	Chowpatty
10	A.A.B.V.V. Matunga	" "	" "	Matunga
11	Podar High School	" "	" "	Santa-Cruz
12	Bharda High School	" "	Boys	Boribundar
13	M.A. Highschool	" "	Boys & Girls	Andheri
14	Navjivan Vidyalaya	" "	" "	Malad
15	Goklibai High School	" "	" "	Vile-Parle
16	Saifee High School	" "	Boys	Pythonia
17	Gamdevi Muni. High School	Muni.	Boys & Girls	Gamdevi
18	Parekhwadi Muni.	" "	Girls	Girgaum
19	Mandvi Muni.	" "	Boys & Girls	Mandvi
20	Kika Street	" "	" "	Kika Street
21	Mazgaon	" "	" "	Mazgaon
22	New Princess St.	" "	" "	Princess St.
23	Lady Hardinge	" "	" "	Matunga
24	Laxmi Nagar	" "	" "	Khar
25	Lalji Trikamji	" "	" "	Borivali
26	Shantinagar	" "	" "	Sat Raste
27	Deleil Road	" "	" "	Deleil Road.
28	Dhanji Devshi	" "	" "	Ghatkopar
29	New Sion	" "	" "	Sion
30	Rambhabhai	" "	" "	Kalbadevi



No.	Name of the school	Whether Muni. or Non-Muni.	Whether Boys Or Girls	Location of the school.
31	Grant Road Muni. High School	Muni.	Boys & Girls	Grant Rd.
32	Suniti Girls High School	Non- Muni.	Girls	Girgaum
33	Velji Napoo High School	Boys "	Boys	Matunga
34	Shakuntala Girls High School	" "	Girls	Marine Lines
35	Premji Devshi Rashtriya-shala	" "	Girls	Ghatkopar

It will be seen from the above table that schools from almost all the areas of the city and suburbs were selected and the sample selected at random was the representative of the whole population of the Bombay city.

Table No. 126

The following table shows the number of boys, the number of girls and the total number of pupils to whom the tests were administered in Standards VII, VI and V

Subject	Standard VII			Standard VI			Standard V		
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
Gujarati	939	640	1579	743	735	1478	718	935	1653
Hindi	973	635	1608	763	735	1498	813	733	1546
Arithmetic	991	690	1681	687	755	1442	764	769	1533
History	885	686	1571	819	801	1620	687	823	1510
Geography	989	637	1626	828	798	1626	790	776	1566
Science	1014	736	1750	757	705	1462	855	737	1592



STANDARDISATION OF THE TESTS

Most standardised tests can broadly be divided into two main categories. (1) School - subject tests. (2) Psychological tests. "School - subject tests grow out of the school routine and examine in those things purposely taught in school, namely the knowledge, skills and arts. Psychological tests on the other hand aim at the measurement of attitudes, emotions, natural ability, temperament, etc."<sup>1</sup> The present experiment is concerned with the school-subject tests.

To quote Thorndike, "Standardised tests do not represent anything new and strange in the measurement of academic achievement. They are blood brothers of the short answer teacher-made tests."<sup>2</sup> No doubt, such tests are expected to be much more elaborate and scientifically prepared than the teacher - made tests.

A standardisation of a test involves the steps of construction, administration, evaluation and interpretation. According to Menzel,<sup>3</sup> "A fully standardised test is standardised in three respects : (i) in form and construction (ii) in the way it is administered and evaluated; and (iii) so that the score of any examinee can be quickly and easily compared with the scores of other examinees of the same age, school placement or other classifications. According to Ross,<sup>4</sup> a standardised test differs from the informal tests in four essential aspects.

- 1) The content has been standardised;
- 2) The method of administration has been standardised;
- 3) The method of scoring has been standardised;
- 4) The process of interpretation has been standardised

1. Menzel E.W., "Suggestions for the Use of New-Type Test India". Oxford University Press, 1952. P.40
2. Thorndike R.L. Hagen E. "Measurement and Evaluation in Education and Education", Jhon Wiley & Sons. Inc. N.Y. P.269
3. Menzel E.W., "Suggestions for the Use of New-Type Test India" Oxford University Press, 1952. P.27.
4. Ross G.C., "Measurement in To-day's Schools," Prentice-Hall Inc. 1956. P.274-275.



(1) The Content :

As discussed in chapter III and IV, in the present experiment, the items were reviewed and were analysed. The weaker items were rejected. The selected items were arranged in order of difficulty. Thus, the contents were standardised.

(2) The Method of Administration :

As discussed in chapter V and VI, the time limits for both the tests were fixed. From experiences of the pre-pilot and pilot testing, adequate changes in (1) the general directions (2) directions for sub-tests (3) the method of recording the responses in multiple-choice tests and other modifications regarding types, printing, spacing etc. were introduced. In this way, the method of administration was standardised.

(3) The Method of Scoring :

Before the scoring-work begins, the answer keys and the manual of directions would be prepared.

a) The preparation of Answer-key :

Answer key should include all the correct responses to make it complete and exact. Answer keys for all the tests were prepared by studying the responses of the pupils from the pre-pilot and pilot testing. Answer keys for all the tests are reproduced in appendix .

b) The Manual of Directions :

Regarding directions to the examiners and to the subjects, Lindquist quotes Feder : " Builders of standard tests should recognise the importance of adequate, but not cumbersome, directions and of determining by experimental procedures the best directions before marketing their products." 5

5. Lindquist E.F., "Educational Measurement" American Council on Education, Washington D.C. 1955. P. 351-352



As suggested by Lindquist,<sup>6</sup> Special attention should be given to the following criteria while writing the directions for the administration of the test.

- 1) Assume that the examiner and examinees know nothing at all about objective tests.
- 2) In writing the directions, use a clear succinct style.
- 3) Make the more important directions stand out through the use of different sizes and styles of type.
- 4) Give the examiner and each proctor full instructions concerning what to do before and after the test is given as well as during its administration.
- 5) Check on all possible misunderstandings and inconsistencies.

Administrator of a test must have at hand a list of procedures to be followed in preparing for the test, during the test and after the test has been given.

From, the experiences of the pre-pilot and pilot testing the manual of directions for the tests was prepared. It is reproduced in appendix

c) The Actual Scoring :

The answer-keys thus prepared were reproduced in the blank booklet of each test. Then strips of answer-keys were cut from the booklet and was pasted on a card-board. Naturally, these strips of different sub-tests contained as much spacing between the answers as in the pages of booklet. The test-booklets were examined by superimposing the key-strips on the answer-papers.

All the 18 test booklets of Standards V, VI and VII in all the subjects were examined, assigning one point to each correct response. Scores of correct scores for each sub-test were noted on the front page of the booklet. By adding the

6. Ibid P. 352



score obtained in each subject, the total score obtained by each subject were found out.

#### 4) The process of Interpretation :

Norms are of great value in interpreting the scores. Flanagan's opening sentence regarding norms is highly pertinent. "Test scores are meaningful and valuable to the extent that they can be interpreted in terms of capacities, abilities and accomplishments of educational significance."<sup>7</sup>

There are following main types of norms :

- (a) The age norms; (b) The school-grade norms ;
  - (c) The percentile norms; (d) The standard score norms.
- Among these No. (d) is the derived score.

##### (a) The Age Norms :

The age norms are very useful in psychological tests. But the achievement of a pupil in a particular subject is affected by many factors other than age. "Tests intended for use in the secondary school are more frequently provided with percentile and grade norms only. Age norms do not seem to be particularly useful at the high school and college levels, since so many factors other than age operate to affect achievement."<sup>8</sup> As the present experiment deals with achievement tests, age norms are not useful.

##### (b) The School-grade Norms :

As there are separate tests for standards V, VI and VII in the present experiment, the question of fixing the school-grade norms is out of focus.

##### (c) The Percentile Norms :

A percentile norm is an estimate of a population percentile. Percentile norms interpret a pupil's score showing

7. Ibid. P. 695  
 8. Greene H.A., Jorgensen A.N., Gerberich J.R. "Measurement and Evaluation in the Secondary School," Longmans Green and Co., 1955 P. 95



his position in the group in terms of the percent of pupils.

Ross<sup>9</sup> mentions the two limitations of percentile norms neither of which is usually very serious for most purposes.

- (a) The scale values are unequal in length;
- (b) The percentile values in one grade or age group are not easily comparable with those in another.

In the present experiment, the question of comparing one grade or age group with another does not arise. Accordingly, the percentile norms for both the tests were computed.

#### (d) The standard Score Norms :

Standard scores are also known as sigma scores or Z - Scores. "These units are expressed in terms of the mean and standard deviation of the typical age or grade or, for that matter, of any group."<sup>10</sup> Ross quotes Thurstone: "..... standard scores or percentile scores yield much more information even for young children."<sup>10</sup> According to Lindquist, " Such scores simplify interpretation and increase comparability."<sup>11</sup>

In the present experiment, the standard scores for both the tests were computed.

#### Separate Norms :

Place and sex affect the norms. Sometimes, separate norms for urban and rural areas and separate norms for boys and girls are also calculated."..... separate norms for rural and urban areas are also determined to show the effect of varying environments. If the sex difference is found to be appreciable, separate norms for boys and girls are also fixed."<sup>12</sup> Such separate norms are useful in the case of some psychological tests.

Menzel is not in favour of separate norms for school-subject tests.

9. Ross G.C., "Measurement in To-day's Schools," Prentice-Hall, Inc., 1956. P.295

10. Ibid P. 290

11. Lindquist E.F., "Educational Measurement" American Council on Education, Washington D.C. 1955. P. 723.

12. Desai K.G., "The Construction and standardisation of a Battery of group Tests of Intelligence in Gujarati." Bharat Prakashan, Ahmedabad, 1954, P.101



His argument is, "... in school subjects" there has not been any consistent difference between the sexes large enough to be taken into general consideration.<sup>13</sup> He further adds, "There is talk of having rural and urban norms, for in certain things the city children do have an indisputable advantage. In India where the city monopolizes such a large percentage of the educational groups and the rural areas are backward, a different standard will probably be considered only natural when we realise the handicaps of rural children."<sup>14</sup>

Considering the above views separate norms for boys and girls, for urban and rural areas were not computed in the present experiment.

#### The Measures of Central Tendency :

Norms are given by the central tendency of the group. There are three measures of central tendency.

(1) the mean (2) the median (3) The mode.

Of these, the mode is an unstable measure and therefore it is not reliable. Therefore, the mode is not computed for both the tests in the present experiment.

The following tables show the frequency distribution of the boys, the girls and the total population for standards V, VI and VII for the different subjects.

T A B L E



The following tables show the Frequency distribution of the Total sample (Boys and Girls together) in the various Tests for the three standards namely Std. V, VI and VII

T A B L E No. 127

Std. VII Frequency Distribution. Boys & Girls together  
 Gujarati Hindi Arith History. Geography. Science.  
 metic.

Step Inter-	f	f	f	f	f	f
160-169	1	-	-	-	-	-
150-159	4	-	-	1	1	1
140-149	11	-	-	1	2	7
130-139	29	8	-	8	2	22
120-129	48	12	-	20	14	39
110-119	101	40	-	82	34	91
100-109	165	77	-	132	74	171
90 - 99	235	146	-	224	149	253
80 - 89	263	216	-	317	340	282
70 - 79	269	259	-	364	289	299
60 - 69	205	286	16	223	312	237
50 - 59	121	257	68	86	121	204
40 - 49	76	170	225	64	98	91
30 - 39	36	103	623	36	67	36
20 - 29	9	26	568	10	20	13
10 - 19	5	7	166	2	2	2
0 - 9	1 / 1579	1 / 1608	15 / 1681	1 / 1571	1 / 1626	2 / 1750

T A B L E No. 128

Std. VI Boys & Girls together.  
 Gujarati Hindi Arithmetic History Geography science.

Step Inter-	f	f	f	f	f	f
150 - 159	-	-	-	-	-	1
140 - 149	-	-	-	-	-	8
130 - 139	-	-	-	-	1	24



Gujarati Hindi Arithmetic History Geography Science

120 ~ 129	10	17	-	-	6	49
110 ~ 119	8	30	-	3	15	63
100 ~ 109	47	74	-	18	39	182
90 ~ 99	102	97	-	30	115 <del>197</del>	197
80 ~ 89	166	172	14	101	222	234
70 ~ 79	201	213	35	199	346	233
60 ~ 69	305	261	92	324	421	167
50 ~ 59	271	235	312	429	268	140
40 ~ 49	202	207	459	296	107	95
30 ~ 39	106	126	336	153	62	49
20 ~ 29	46	49	141	54	19	16
10 ~ 19	12	13	47	11	4	4
0 ~ 9	2/1478	4/1498	6/1442	2/1620	1/1626	- /1462

T A B L E No. 129

Standard V

Boys & Girls together.

Gujarati Hindi Arithmetic History Geography Science

150 ~ 159	2	-	-	-	-	-
140 ~ 149	12	-	-	-	2	5
130 ~ 139	21	1	-	-	3	18
120 ~ 129	67	10	-	2	11	39
110 ~ 119	120	36	-	9	49	80
100 ~ 109	186	63	-	31	108	144
90 ~ 99	238	138	1	71	221	205
80 ~ 89	265	198	9	174	349	222
70 ~ 79	230	241	29	379	334	260
60 ~ 69	201	285	137	399	227	241
50 ~ 59	134	237	384	242	98	163
40 ~ 49	92	187	562	110	76	121
30 ~ 39	57	102	292	41	61	61
20 ~ 29	23	37	86	26	21	22
10 ~ 19	4	9	26	6	5	9
0 ~ 9	1/1653	2/1546	3/1533	- 1510	1/1566	2/1592



The following tables show the Frequency Distribution of Boys and Girls separately in the various tests for the three Standards namely std. V, VI and VII

T A B L E 130

<u>Std. VII</u>	<u>Frequency Distribution</u>					<u>Boys.</u>
	Gujarati	Hindi	Arithmetic	History	Geography	Science
Step interval	f	f	f	f	f	f
160 - 169	1	-	-	-	-	-
150 - 159	4	-	-	1	-	1
140 - 149	9	-	-	-	2	3
130 - 129	22	7	-	5	2	12
120 - 119	33	10	-	11	5	25
110 - 109	79	30	-	51	20	57
100 - 109	112	50	-	78	38	97
90 - 89	155	98	-	125	81	141
80 - 79	167	132	-	171	182	156
70 - 69	149	162	-	200	224	164
60 - 59	93	156	13	133	228	129
50 - 49	53	148	53	58	88	130
40 - 39	32	96	144	29	61	62
30 - 29	21	62	370	17	47	24
20 - 19	6	18	318	5	10	10
10 - 9	3	4	89	1	0	10
0 - 9	-/939	-/ 1973	4/ 1991	-/ 885	1/989	2/ 1014

T A B L E 131

<u>Standard VI</u>						<u>Boys.</u>
	Gujarati	Nindi	Arithmetic	History	Geography	Science
Step interval	f	f	f	f	f	f
150 - 159	-	-	-	-	-	1
140 - 149	-	-	-	-	-	6
130 - 129	-	-	-	-	-	18
120 - 119	6	11	-	-	4	23
110 - 109	6	16	-	3	7	33



Gujarati Hindi Arithmetic History Geography Science

100 - 109	24	34	-	17	11	90
90 - 99	50	54	-	20	53	116
80 - 89	71	82	11	52	105	116
70 - 79	91	124	21	105	191	114
60 - 69	156	157	58	144	212	85
50 - 59	165	115	140	195	153	68
40 - 49	92	90	194	137	59	53
30 - 39	52	57	155	100	26	25
20 - 29	21	17	81	38	5	7
10 - 19	8	4	23	6	1	2
0 - 9	1/743	2 / 763	4 / 687	2 / 819	- / 828	- / 757

TABLE 132

Standard V

Boys

Gujarati Hindi Arithmetic History Geography Science

f f f f f f

150 - 159	-	-	-	-	-	-
140 - 149	7	-	-	-	1	4
130 - 139	10	1	-	-	3	8
120 - 129	31	8	-	2	6	20
110 - 119	43	25	-	5	31	41
100 - 109	69	37	-	18	51	68
90 - 99	95	76	1	44	114	104
80 - 89	114	73	3	101	165	107
70 - 79	115	105	14	198	167	160
60 - 69	97	140	81	203	109	137
50 - 59	59	113	204	133	62	101
40 - 49	46	76	283	77	42	63
30 - 39	19	55	130	22	29	28
20 - 29	11	16	30	16	9	12
10 - 19	1	7	15	4	1	2
0 - 9	1/718	711 / 733	3 / 764	- / 823	- / 790	- / 855



TABLE 133

<u>Standard VII</u>	<u>Frequency Distribution</u>					<u>Girls</u>
<u>Step Interval</u>	<u>Gujarati f</u>	<u>Hindi f</u>	<u>Arithmetic f</u>	<u>History f</u>	<u>Geography f</u>	<u>Science f</u>
150 - 159	-	-	-	-	1	-
140 - 149	2	-	-	1	-	4
130 - 129	7	1	-	3	-	10
120 - 119	15	2	-	9	9	14
110 - 109	22	10	-	31	14	34
100 - 109	53	27	-	54	36	74
90 - 89	80	48	-	99	68	132
80 - 79	96	84	-	146	158	126
70 - 69	120	97	-	164	165	135
60 - 59	112	130	3	90	84	108
50 - 49	68	109	15	28	33	74
40 - 39	44	74	81	35	37	29
30 - 29	15	41	253	19	20	12
20 - 19	3	8	250	5	10	3
10 - 9	2	3	77	1	2	1
0 - 9	1 / 640	1 / 635	11 / 690	1 / 686	1 / 637	1 / 736

TABLE No. 134

<u>Standard VI</u>	<u>Frequency Distribution</u>					<u>Girls</u>
<u>Step Interval</u>	<u>Gujarati f</u>	<u>Nindi f</u>	<u>Arithmetic f</u>	<u>History f</u>	<u>Geography f</u>	<u>Science f</u>
150 - 159	-	-	-	-	-	-
140 - 149	-	-	-	-	-	2
130 - 129	-	-	-	-	-	6
120 - 119	4	6	-	-	2	26
110 - 109	2	14	-	-	8	30
100 - 109	23	40	-	1	28	92
90 - 89	52	43	-	10	62	81
80 - 79	95	90	3	49	117	118
70 - 69	110	89	14	94	155	119
60 - 59	149	104	34	180	209	82



	Gujarati	Hindi	Arithmetic	History	Geography	Science
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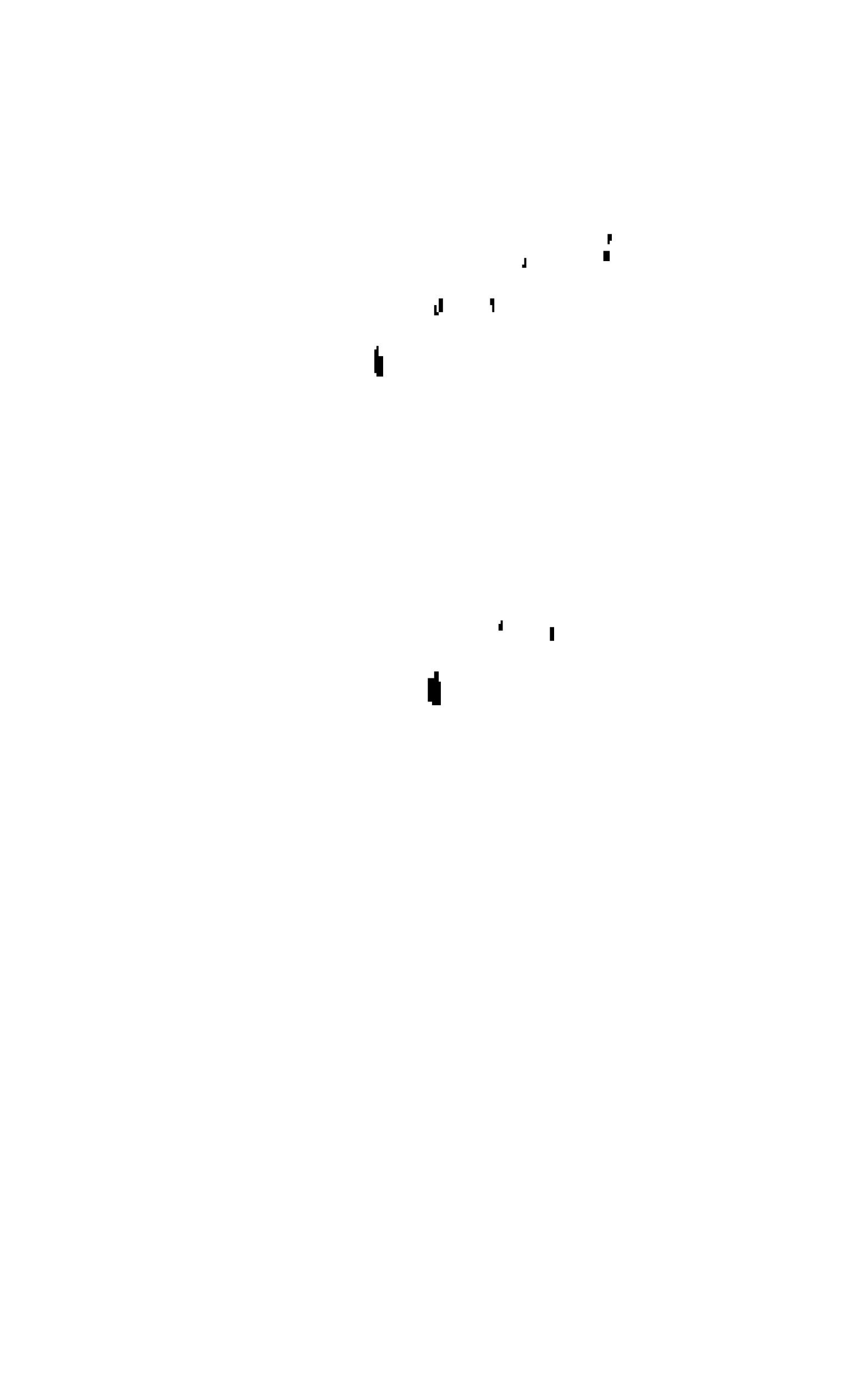
50 - 59	106	120	172	234	115	72
40 - 49	110	117	265	159	48	42
30 - 39	54	69	181	53	36	24
20 - 29	25	32	60	16	14	9
10 - 19	4	9	24	5	3	2
0 - 9	1/735	2/735	2/755	- 801	1/ 798	- 705

TABLE No. 135

Standard VGirls

	Gujarati	Hindi	Arithmetic	History	Geography	Science
150 - 159	2	-	-	-	-	-
140 - 149	5	-	-	-	1	1
130 - 139	11	-	-	-	-	10
120 - 129	36	2	-	-	5	19
110 - 109	77	11	-	4	18	39
100 - 109	117	26	-	13	57	76
90 - 89	143	62	-	47	107	101
80 - 89	151	125	6	73	184	115
70 - 79	115	136	15	181	167	100
60 - 69	104	145	56	196	118	104
50 - 59	75	124	180	109	36	62
40 - 49	46	111	279	33	34	58
30 - 39	38	47	162	19	32	33
20 - 29	12	21	56	10	12	10
10 - 19	3	2	11	2	4	7
0 - 9	-/ 935	1/ 813	4/ 769	- / 687	1/ 776	2/ 737

Tables 136 to 153 show the Means, Mediana, Standard Deviations, the Standard error of the mean, the Standard error of Standard deviations and the Quartile Deviation of the total population as well as boys and girls separately of all the 18 tests of Standard VII. VI. V.



T A B L E No.136

The Table showing the Mean, Median, Standard, S.E. Deviation of the Scores of the Total group. -  
(Boys & Girls together)

for standards V, VI and VII

Subject : Gujarati

	V N = 1653	VI N = 1478	VII N = 1579
Mean	81.89	63.68	82.49
S.E. of Mean	0.60	0.53	0.60
Median	82.69	62.78	82.06
S.E. of Median	0.75	0.65	0.74
Standard Deviation	23.71	20.52	23.6
S.E. of Standard Deviation	0.79	0.38	0.42
Quartile Deviation	17.35	14.06	15.67

T A B L E No. 137

The Table showing the Mean, Median, Standard Deviation of the Scores of the Total group.

(Boys & Girls together)

for Standards V, VI and VII

Subject : Hindi

	V N = 1546	VI N = 1498	VII N = 1608
Mean	67.27	65.06	68.96
S.E. of Mean	0.51	0.59	0.57
Median	66.48	63.91	67.89
S.E. of Median	0.94	0.74	0.71
Standard Deviation	20.02	22.76	22.75
S.E. of Standard Deviation	0.53	0.26	0.43
Quartile Deviation	15.46	16.04	15.40



T A B L E No. 138

The Table showing the Mean, Median, Standard Deviation of the Scores of the Total group.  
(Boys & Girls together)

for standards V, VI and VIII

Subject : Arithmetic

	V N= 1533	VI N= 1442	VII N= 1681
Mean	45.91	43.63	31.17
S.E. of Mean	0.29	0.35	0.25
Median	45.82	43.69	30.71
S.E. of Median	0.36	0.45	0.31
Standard Deviation	11.53	13.49	10.10
S.E. of Standard Deviation	0.21	0.24	0.49
Quartile Deviation	7.78	9.00	6.49

T A B L E No. 139

The table showing the Mean, Median, Standard Deviation of the scores of the total group.

(Boys & Girls together)

for Standards V, VI and VII

Subject : History.

	V N= 1510	VI N= 1620	VII N= 1571
Mean	67.56	57.19	79.92
S.E. of Mean	0.36	0.37	0.41
Median	67.77	56.35	79.48
S.E. of Median	0.45	0.46	0.55
Standard Deviation	13.82	14.73	19.9
S.E. / Standard Deviation	0.20	0.26	0.31
Quartile Deviation	10.07	11.04	12.34



T A B L E No. 140

The Table showing the Mean, Median, Standard Deviation of the Scores of the Total group.

(Boys & Girls together)

for Standards V, VI and VII

Subject : Geography

	V N= 1566	VI N= 1626	VII N= 1626
Mean	76.81	68.43	73.67
S.E. of Mean	0.48	0.43	0.48
Median	78.30	67.85	74.43
S.E. of Median	0.61	0.54	0.66
Standard Deviation	19.03	17.49	19.36
S.E. of Standard Deviation	0.34	0.31	0.34
Quartile Deviation	11.98	10.90	11.52

T A B L E No. 141

The Table showing the Mean, Median, Standard Deviation of the Scores of the Total group.

(Boys & Girls together)

for Standards V, VI and VII

Subject : Science

	V N= 1592	VI N= 1462	VII N= 1750
Mean	76.82	80.29	79.62
S.E. of Mean	0.58	0.80	0.54
Median	76.31	80.65	79.19
S.E. of Median	0.73	0.79	0.68
Standard Deviation	23.19	24.29	22.60
S.E. of Standard Deviation	0.37	0.50	0.49
Quartile Deviation	16.86	17.19	15.99



The following Tables show Mean, Median, Standard Deviation and the Quartile Deviation of the Scores for Boys and Girls separately

T A B L E No. 142BoysSubject: Gujarati

V	VI	VII
<u>N</u> = 718	<u>N</u> = 743	<u>N</u> = 939

Mean	80.77	63.42	86.25
Standard Error of Mean	0.92	0.75	0.71
Median	80.38	61.58	86.24
Standard Error of Median	1.16	0.94	0.97
Standard Deviation	24.78	20.49	23.8
Standard Error of Standard Deviation	0.65	0.53	0.55
Quartile Deviation	16.79	13.07	15.23

T A B L E No. 143GirlsSubject: Gujarati

V	VI	VII
<u>N</u> = 935	<u>N</u> = 735	<u>N</u> = 640

Mean	82.75	64.07	77.0
Standard Error of Mean	0.95	0.76	0.88
Median	84.43	64.03	75.75
Standard error of Median	1.01	0.95	1.09
Standard Deviation	24.66	20.49	22.2
Standard error of Standard Deviation	0.57	0.53	0.61
Quartile Deviation	17.74	15.13	14.98



T A B L E No. 144

<u>Boys</u>	<u>Subject: Hindi</u>		
	V N=733	VI N=763	VII N=973
Mean	68.21	66.73	69.28
Standard Error of Mean	0.85	0.79	0.73
Median	66.54	65.64	69.65
Standard Error of Median	1.11	0.75	0.91
Standard Deviation	23.11	20.86	22.63
Standard Error of Standard deviation	0.60	0.53	0.51
Quartile Deviation	16.27	14.48	16.04

T A B L E No. 145

<u>Girls</u>	<u>Subject: Hindi</u>		
	V N=813	VI N=735	VII N=635
Mean	66.42	63.41	66.91
Standard error of Mean	0.68	0.69	0.70
Median	66.43	61.28	65.77
Standard error of Median	0.86	1.09	0.88
Standard Deviation	19.44	23.45	19.08
Standard Error of Standard deviation	0.43	0.70	0.49
Quartile Deviation	15.06	17.45	14.33

T A B L E No. 146

<u>Boys</u>	<u>Subject: Arithmetic</u>		
	V N=764	VI N=687	VII N=991
Mean	46.83	43.93	33.03
Standard error of Mean	0.28	0.47	0.39
Median	46.71	43.65	31.26
Standard Error of Median	0.22	0.70	0.41
Standard Deviation	9.88	14.70	10.20
Standard error of Standard Deviation.	0.39	0.28	0.24
Quartile Deviation	6.84	8.91	5.86

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T A B L E No. 147GirlsSubject: Arithmetic

	V N= 769	VI N= 755	VII N= 690
Mean	44.99	43.35	29.93
Standard Error of Mean	0.53	0.43	0.39
Median	44.93	43.68	29.75
Standard Error of Median	0.47	0.51	0.49
Standard Deviation	12.41	11.75	9.60
Standard error of Standard deviation	0.22	0.28	0.27
Quartile Deviation	8.06	8.16	6.49

T A B L E No. 148BoysSubject: History

	V N= 823	VI N= 819	VII N= 885
Mean	66.98	57.04	80.31
Standard Error of Mean	0.53	0.57	0.67
Median	67.36	55.99	79.48
Standard Error of Median	0.68	0.75	0.85
Standard Deviation	15.46	17.06	19.7
Standard error of Standard Deviation	0.38	0.42	0.48
Quartile Deviation	10.84	12.59	12.81

T A B L E No. 149GirlsSubject: History

	V N= 687	VI N= 801	VII N= 686
Mean	68.26	57.33	79.38
Standard Error of Mean	0.61	0.42	0.78
Median	68.19	56.66	79.5
Standard error of Median	0.76	0.53	0.96
Standard Deviation	15.87	11.92	20.1
Standard error of Standard deviation	0.43	0.30	0.54
Quartile Deviation	9.10	9.74	11.70



T A B L E No.150BoysSubject: Geography

	V N= 790	VI N= 828	VII N= 989
Mean	77.02	68.08	72.04
Standard error of Mean	0.69	0.43	0.56
Median	78.06	67.52	72.15
Standard error of Median	0.837	0.72	0.70
Standard Deviation	18.97	16.49	17.58
Standard error of Standard deviation	0.48	0.41	0.37
Quartile Deviation	12.88	10.53	11.40

T A B L E No. 151GirlsSubject: Geography

	V N= 776	VI N= 798	VII N= 637
Mean	76.59	68.79	76.20
Standard Error of Mean	0.68	0.65	0.75
Median	78.54	68.21	77.53
Standard error of Median	0.86	0.82	0.94
Standard Deviation	19.08	18.47	18.89
Standard error of Standard deviation	0.48	0.46	0.53
Quartile Deviation	11.66	11.51	10.61



T A B L E No. 152

<u>Boys</u>	<u>Subject: Science</u>		
	V N=855	VI N=757	VII N= 1014
Mean	76.22	81.05	78.86
Standard error of Mean	0.78	0.90	0.94
Median	74.78	81.61	78.69
Standard error of Median	0.98	1.13	0.98
Standard Deviation	22.83	24.80	23.40
Standard error of standard Deviation	0.55	0.64	0.52
Quartile Deviation	16.22	17.20	18.98

T A B L E No. 153

<u>Girls</u>	<u>Subject: Science</u>		
	V N=737	VI N=705	VII N= 736
Mean	77.53	79.48	78.30
Standard error of Mean	0.86	0.98	0.79
Median	78.75	79.71	79.97
Standard error of Median	21.08	1.12	0.99
Standard deviation	23.41	23.73	21.44
Standard error of Standard deviation	0.85	0.90	0.56
Quartile Deviation	17.52	17.09	14.85

It can be seen from the above tables that in most of the cases :

- 1) The mean of the whole group is nearly half the total No. of items.
- 2) The Mean and Median are very near each other.
- 3) The Means of Boys and Girls fluctuate considerably so that it is not possible to come to any decisive conclusion whether Boys are superior to Girls or Vice Versa.
- 4) Standard Deviation is nearly 1/6th of the total No. of items approximately.

#### The Percentile Norms:

The percentiles of the frequency distribution of the total group as well as Boys and Girls separately computed, using the formula given by Garrett H.E. "Statistics in Psychology and Education" Longmans Green & Co. New York 1951. P.78.



Tables showing certain percentile of the whole group  
 (Boys and Girls together) in the Frequency Distribution of the various tests for Standards V, VI and VII in the first experiment.

T A B L E No. 154Subject : Gujarati

Percentiles	V	VI	VII
	N = 1653	N = 1478	N = 1579
P <sub>5</sub>	39.08	30.81	43.18
P <sub>10</sub>	48.23	37.78	52.05
P <sub>20</sub>	60.48	45.92	62.82
P <sub>25</sub>	64.59	49.56	66.65
P <sub>30</sub>	68.69	52.28	70.27
P <sub>40</sub>	75.99	57.74	76.14
P <sub>50</sub>	82.69	62.78	82.06
P <sub>60</sub>	88.93	67.62	88.07
P <sub>70</sub>	95.81	71.52	94.62
P <sub>75</sub>	99.28	77.68	97.98
P <sub>80</sub>	103.66	81.75	102.12
P <sub>90</sub>	114.23	91.38	113.08
P <sub>95</sub>	122.38	98.63	122.42
P <sub>99</sub>	138.29	113.52	139.69

T A B L E No. 155Subject : Hindi

Percentiles	V	VI	VII
	N = 1546	N = 1498	N = 1608
P <sub>5</sub>	32.37	30.21	34.00



Percentile	V N= 1546	VI N= 1498	VII N= 1608
P <sub>10</sub>	39.75	36.15	40.90
P <sub>20</sub>	48.01	44.69	50.06
P <sub>25</sub>	51.59	48.32	53.19
P <sub>30</sub>	54.85	51.64	56.32
P <sub>40</sub>	61.06	58.02	62.27
P <sub>50</sub>	66.48	63.91	67.89
P <sub>60</sub>	72.35	69.68	73.93
P <sub>70</sub>	78.76	76.71	80.27
P <sub>75</sub>	82.51	80.40	83.99
P <sub>80</sub>	86.41	84.75	87.71
P <sub>90</sub>	96.27	96.53	97.87
P <sub>95</sub>	104.69	105.73	106.85
P <sub>99</sub>	118.26	120.69	123.77

Subject : Arithmetic      T A B L E No. 156

Percentile	V N= 1533	VI N= 1442	VII N= 1681
P <sub>5</sub>	21.09	20.85	15.64
P <sub>10</sub>	30.67	25.97	18.98
P <sub>20</sub>	35.92	32.31	22.57
P <sub>25</sub>	38.55	34.46	24.23
P <sub>30</sub>	40.37	36.60	25.62
P <sub>40</sub>	43.09	40.52	28.28
P <sub>50</sub>	45.82	43.69	30.71
P <sub>60</sub>	49.26	46.80	32.92
P <sub>70</sub>	52.11	50.15	35.48



Percentiles	V	VI	VII
	N=1533	N=1442	N= 1681

P <sub>75</sub>	54.10	52.46	37.21
P <sub>80</sub>	56.09	54.77	38.94
P <sub>90</sub>	61.16	59.39	44.14
P <sub>95</sub>	66.75	66.99	49.49
P <sub>99</sub>	77.66	79.38	59.34

Subject : History

TABLE No. 157

Percentiles	V	VI	VII
	N=1510	N=1620	N=1571

P <sub>5</sub>	39.73	30.42	44.11
P <sub>10</sub>	46.59	35.71	54.62
P <sub>20</sub>	54.42	43.01	64.66
P <sub>25</sub>	57.54	45.75	68.18
P <sub>30</sub>	60.60	48.48	70.85
P <sub>40</sub>	63.98	52.57	75.17
P <sub>50</sub>	67.77	56.35	79.48
P <sub>60</sub>	71.66	60.33	84.44
P <sub>70</sub>	75.65	65.33	89.39
P <sub>75</sub>	77.67	67.83	92.86
P <sub>80</sub>	79.79	70.85	96.36
P <sub>90</sub>	88.47	78.99	106.08
P <sub>95</sub>	95.82	86.59	113.58
P <sub>99</sub>	108.18	102.17	126.65

TABLE No. 158

Subject : Geography

Percentiles	V	VI	VII
	N=1566	N=1626	N=1626

P <sub>5</sub>	37.91	30.77	38.20
P <sub>10</sub>	48.53	46.65	46.91



Percentile	V N=1566	VI N=1626	VII N=1626
P <sub>20</sub>	61.76	54.43	60.02
P <sub>25</sub>	65.21	57.47	62.62
P <sub>30</sub>	68.65	60.13	65.23
P <sub>40</sub>	73.61	63.53	70.26
P <sub>50</sub>	78.30	67.85	74.43
P <sub>60</sub>	82.84	72.21	78.62
P <sub>70</sub>	87.33	76.91	83.27
P <sub>75</sub>	89.16	79.27	85.66
P <sub>80</sub>	93.16	82.78	83.06
P <sub>90</sub>	101.02	90.7	97.11
P <sub>95</sub>	108.27	97.75	105.68
P <sub>99</sub>	119.81	113.33	121.46

TABLE No. 159

Subject : Science :

Percentiles	V N=1592	VI N=1462	VII N=1750
P <sub>5</sub>	37.14	39.93	43.29
P <sub>10</sub>	44.89	47.63	51.02
P <sub>20</sub>	55.84	58.67	59.58
P <sub>25</sub>	60.33	63.18	63.28
P <sub>30</sub>	63.63	67.56	66.97
P <sub>40</sub>	70.18	74.38	73.34
P <sub>50</sub>	76.31	80.65	79.19
P <sub>60</sub>	82.93	86.90	85.38
P <sub>70</sub>	90.15	93.83	91.83
P <sub>75</sub>	94.04	97.55	95.29
P <sub>80</sub>	97.92	101.40	98.75
P <sub>90</sub>	108.31	109.43	108.62
P <sub>95</sub>	117.3	121.32	117.47
P <sub>99</sub>	133.43	137.16	135.18



The following tables show the percentile norms of Boys and Girls separately in the tests in the Present experiment

T A B L E No. 160

Subject

B O Y SSubject: Gujarati

Percentiles	V	VI	VII
	N <sub>e</sub> . 718	N <sub>e</sub> . 743	N <sub>e</sub> . 939
P <sub>5</sub>	40.35	30.87	44.79
P <sub>10</sub>	48.15	38.02	55.52
P <sub>20</sub>	60.18	46.74	67.33
P <sub>25</sub>	63.88	50.21	71.29
P <sub>30</sub>	67.58	52.46	74.45
P <sub>40</sub>	74.13	56.97	80.61
P <sub>50</sub>	80.38	61.58	86.24
P <sub>60</sub>	86.68	66.35	92.04
P <sub>70</sub>	93.67	72.26	98.1
P <sub>75</sub>	97.45	76.34	101.75
P <sub>80</sub>	101.88	80.68	105.94
P <sub>90</sub>	113.97	91.84	116.35
P <sub>95</sub>	123.40	99.27	126.18
P <sub>99</sub>	138.82	117.11	144.62

T A B L E No. 161G I R L SSubject : Gujarati

Percentiles	V	VI	VII
	N <sub>e</sub> . 935	N <sub>e</sub> . 735	N <sub>e</sub> . 640
P <sub>5</sub>	37.86	30.75	42.0
P <sub>10</sub>	48.30	37.56	49.27
P <sub>20</sub>	60.75	45.23	58.76
P <sub>25</sub>	65.25	48.57	61.91



Percentile	V N= 935	VI N= 735	VII N= 640
P <sub>30</sub>	69.72	52.00	64.77
P <sub>40</sub>	77.85	58.93	70.42
P <sub>50</sub>	84.43	64.03	75.75
P <sub>60</sub>	90.69	68.96	81.48
P <sub>70</sub>	97.23	75.45	88.35
P <sub>75</sub>	100.72	78.80	91.87
P <sub>80</sub>	104.71	82.55	95.87
P <sub>90</sub>	114.37	90.94	106.10
P <sub>95</sub>	121.51	98.01	115.86
P <sub>99</sub>	137.36	108.91	133.21

T A B L E No. 162B O Y SSubject: Hindi

Percentile	V N= 733	VI N= 763	VII N= 973
P <sub>5</sub>	31.8	32.15	33.79
P <sub>10</sub>	38.46	38.85	40.88
P <sub>20</sub>	48.39	47.57	50.48
P <sub>25</sub>	52.00	51.30	53.77
P <sub>30</sub>	55.24	54.62	57.06
P <sub>40</sub>	61.3	60.78	63.42
P <sub>50</sub>	66.54	65.64	69.65
P <sub>60</sub>	72.53	70.78	75.66
P <sub>70</sub>	79.51	76.92	82.17
P <sub>75</sub>	84.53	80.26	85.84
P <sub>80</sub>	89.55	84.91	89.54
P <sub>90</sub>	99.19	96.66	99.47
P <sub>95</sub>	108.79	106.22	109.17
P <sub>99</sub>	121.59	122.56	126.77



T A B L E No. 163G I R L S.Subject : Hindi

Percentiles	V N=813	VI N=735	VII N=635
P <sub>5</sub>	33.04	27.55	34.32
P <sub>10</sub>	40.43	33.92	40.92
P <sub>20</sub>	47.75	42.49	49.5
P <sub>25</sub>	51.21	45.63	52.41
P <sub>30</sub>	54.49	48.77	55.33
P <sub>40</sub>	60.82	54.91	60.88
P <sub>50</sub>	66.43	61.28	65.77
P <sub>60</sub>	72.21	68.34	71.04
P <sub>70</sub>	78.18	76.41	77.59
P <sub>75</sub>	81.32	80.53	81.07
P <sub>80</sub>	84.57	84.61	84.86
P <sub>90</sub>	92.68	96.59	94.60
P <sub>95</sub>	99.23	105.31	102.55
P <sub>99</sub>	113.93	118.54	116.15

T A B L E No. 164B O Y SSubject: Arithmetic

Percentile	V N=764	VI N=687	VII N=991
P <sub>5</sub>	26.23	20.41	16.15
P <sub>10</sub>	31.68	24.65	19.72
P <sub>20</sub>	37.56	31.39	23.23
P <sub>25</sub>	39.96	33.61	24.92
P <sub>30</sub>	41.31	35.83	26.31
P <sub>40</sub>	44.01	40.11	29.09
P <sub>50</sub>	46.71	43.65	31.26
P <sub>60</sub>	49.47	47.19	33.33



Percentile	V N=764	VI N=687	VII N= 991
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P <sub>70</sub>	53.31	51.21	36.16
P <sub>75</sub>	54.99	53.66	38.05
P <sub>80</sub>	56.86	56.11	40.11
P <sub>90</sub>	62.29	63.17	45.98
P <sub>95</sub>	67.01	69.09	51.99
P <sub>99</sub>	76.9	83.25	60.69

T A B L E No. 165G I R L SSubject : Arithmetic

Percentile	V N=769	VI N=755	VII N= 690
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P <sub>5</sub>	23.69	21.46	15.04
P <sub>10</sub>	29.86	27.76	17.92
P <sub>20</sub>	34.61	33.09	21.71
P <sub>25</sub>	36.98	35.18	23.24
P <sub>30</sub>	39.36	37.27	24.72
P <sub>40</sub>	42.17	40.83	27.24
P <sub>50</sub>	44.93	43.68	29.75
P <sub>60</sub>	47.69	46.53	32.19
P <sub>70</sub>	50.96	49.38	34.68
P <sub>75</sub>	53.09	51.51	36.22
P <sub>80</sub>	55.23	53.70	37.76
P <sub>90</sub>	59.52	58.09	42.22
P <sub>95</sub>	66.40	63.51	46.33
P <sub>99</sub>	78.37	76.25	55.60



T A B L E No. 166B O Y SSubject : History

Percentile	V N-823	VI N-819	VII N-885
P <sub>5</sub>	39.11	28.17	46.82
P <sub>10</sub>	44.73	33.09	55.79
P <sub>20</sub>	52.93	40.79	64.54
P <sub>25</sub>	56.02	43.79	67.86
P <sub>30</sub>	59.12	46.78	78.62
P <sub>40</sub>	63.30	51.79	75.05
P <sub>50</sub>	67.36	55.99	79.48
P <sub>60</sub>	71.51	60.43	84.65
P <sub>70</sub>	75.62	66.12	89.94
P <sub>75</sub>	77.69	68.96	93.48
P <sub>80</sub>	80.03	72.66	97.02
P <sub>90</sub>	88.18	81.44	106.87
P <sub>95</sub>	95.83	89.32	114.15
P <sub>99</sub>	108.82	106.45	126.90

T A B L E No. 167G I R L SSubject: History

Percentiles	V N-687	VI N-801	VII N-686
P <sub>5</sub>	40.52	33.09	41.87
P <sub>10</sub>	49.93	39.88	52.21
P <sub>20</sub>	56.23	44.92	64.85
P <sub>25</sub>	59.39	47.44	68.67
P <sub>30</sub>	61.19	49.81	71.13
P <sub>40</sub>	64.69	53.23	75.32
P <sub>50</sub>	68.19	56.66	79.5
P <sub>60</sub>	71.89	60.26	84.19



Percentile	V N=687	VI N=801	VII N=686
P <sub>70</sub>	75.68	64.71	88.89
P <sub>75</sub>	77.58	66.93	92.07
P <sub>80</sub>	79.48	69.16	95.55
P <sub>90</sub>	88.86	77.36	104.94
P <sub>95</sub>	95.81	83.57	112.63
P <sub>99</sub>	107.29	92.49	126.32

T A B L E No. 168B O Y SSubject : Geography

Percentile	V N=790	VI N=828	VII N=989
P <sub>5</sub>	39.62	41.09	37.68
P <sub>10</sub>	49.02	48.11	46.20
P <sub>20</sub>	60.88	54.37	58.45
P <sub>25</sub>	64.50	57.08	61.26
P <sub>30</sub>	68.12	59.71	63.43
P <sub>40</sub>	73.33	63.61	67.77
P <sub>50</sub>	78.06	67.52	72.15
P <sub>60</sub>	82.83	71.64	76.57
P <sub>70</sub>	87.62	75.97	81.33
P <sub>75</sub>	90.25	78.14	84.05
P <sub>80</sub>	93.71	80.97	86.76
P <sub>90</sub>	102.05	88.85	95.56
P <sub>95</sub>	109.98	96.03	104.12
P <sub>99</sub>	123.00	114.81	119.05



T A B L E S 169G I R L SSubject: Geography

Percentile	V	VI	VII
	N=776	N=798	N=637

P <sub>5</sub>	36.31	35.58	39.425
P <sub>10</sub>	47.91	44.87	48.07
P <sub>20</sub>	62.57	54.51	62.52
P <sub>25</sub>	65.86	57.97	66.32
P <sub>30</sub>	69.14	60.57	69.81
P <sub>40</sub>	73.89	64.39	73.22
P <sub>50</sub>	78.54	68.21	77.53
P <sub>60</sub>	82.85	72.91	81.47
P <sub>70</sub>	87.07	78.05	85.51
P <sub>75</sub>	89.17	80.99	87.52
P <sub>80</sub>	92.57	84.41	89.58
P <sub>90</sub>	101.1	92.76	98.97
P <sub>95</sub>	106.90	97.58	107.32
P <sub>99</sub>	118.52	112.02	123.53

T A B L E No. 170B O Y SSubject : Science

Percentiles.	V	VI	VII
	N=855	N=757	N=1014

P <sub>5</sub>	39.62	40.24	41.71
P <sub>10</sub>	46.49	47.37	49.68
P <sub>20</sub>	56.03	58.97	57.48
P <sub>25</sub>	60.07	63.53	61.39
P <sub>30</sub>	63.19	66.81	65.33
P <sub>40</sub>	69.43	75.01	72.40



Percentile	V	VI	VII
	N=855	N=757	N=1014
P <sub>50</sub>	74.78	81.61	78.69
P <sub>60</sub>	80.43	88.14	85.03
P <sub>70</sub>	88.41	94.66	91.75
P <sub>75</sub>	92.51	97.93	95.35
P <sub>80</sub>	96.62	101.68	98.94
P <sub>90</sub>	107.66	111.11	109.15
P <sub>95</sub>	116.58	123.91	117.79
P <sub>99</sub>	133.81	139.18	134.38

T A B L E 171G I R L SSubject : Science

Percentile	V	VI	VI
	N=737	N=705	N=736
P <sub>5</sub>	34.91	39.56	46.67
P <sub>10</sub>	43.24	47.95	53.36
P <sub>20</sub>	55.53	58.38	62.11
P <sub>25</sub>	60.68	62.82	65.51
P <sub>30</sub>	64.22	67.12	68.92
P <sub>40</sub>	71.38	73.79	74.49
P <sub>50</sub>	78.75	79.71	79.97
P <sub>60</sub>	85.26	85.69	85.82
P <sub>70</sub>	91.96	92.65	91.93
P <sub>75</sub>	95.61	97.00	95.21
P <sub>80</sub>	99.26	101.13	98.50
P <sub>90</sub>	108.88	108.79	107.93
P <sub>95</sub>	117.74	119.08	116.91
P <sub>99</sub>	133.13	131.08	131.14



C H A P T E R VIITHE RELIABILITY AND THE VALIDITYThe Meaning of Reliability and Validity :

Reliability means the degree to which the test agrees with itself. According to Greene, "A test is said to be reliable when it functions consistently. The reliability of an examination depends on the efficiency with which a test measures what it does measure." 1

A test is said to be valid when it measures what it attempts to measure.

In short, validity is concerned with its truthfulness, while reliability is concerned with its consistency. So, it is possible that a test may be highly reliable, but not at all valid. "A test may be reliable without being valid, but that it cannot be valid unless it is reliable. Therefore, reliability is really an aspect or a phase of validity." 2

Methods of Determining Reliability :-

There are a number of statistical procedures for determining the reliability of a test. The following methods are in common use to determine the reliability of a test:

- 1) The alternate or parallel forms method;
- 2) The test-retest method;
- 3) The split-half method;
- 4) The method of 'rational equivalence.'

1. Greene H.A., Jorgensen A.N., Gerberich J.R., "Measurement and Evaluation in the Secondary School," Longmans, Green and Co., New York, 1955. P. 72.

2. Ibid. P. 72.



1) The Alternate or Parallel Forms Method :

In this method, two separate parallel forms are prepared, the same group is tested with these two equivalent forms under a similar procedure, within a short interval of time to gauge the reliability. It is natural that if a test is reliable, a pupil scoring high marks in the test, also scores high in the equivalent form. The scores on two equivalent forms are correlated and the coefficient of correlation is computed.

Objection :

It is difficult to prepare two equivalent forms. It is possible that the two equivalent forms, prepared, may be identical only in procedure and not in content. There is also a danger of overlapping of items in the two forms. Lindquist states : " In preparing equivalent test forms there is danger, on the one hand, that the two tests will vary so much in content and format that each will have some specific variance distinct from the other, in which case the correlation between the two will under estimate the reliability. There is the reverse danger that the two forms may overlap to such an extent in specific details of content that variance due to specific sampling of content may be common to the two tests. In that case, the variance will be treated as systematic rather than chance variance, and the obtained correlation will over estimate the reliability." <sup>3</sup>

2) The Test-Retest Method :

In this method, the same test is repeated to the same group under a similar condition at a later time. The two series of scores, thus obtained, are correlated and the coefficient of correlation is computed.

3. Lindquist E.F., "Educational Measurement" American Council of Education, Washington D.C., 1955. P. 575.



Objections :

(1) It is difficult to administer the same test twice under a similar condition.

(2) If the retest is administered after a short interval of time, the practice and memory affect the scores. Because of familiarity, the increase in score is very likely.

(3) If the retest is administered after a long interval of time, the score is affected by other factors like maturity growth etc. "In the case of achievement tests, particularly this delay is likely to introduce other variables. The pupils may discuss the test between trials, do extra study, or do other things that may effect a change in the status of their knowledge. In addition to this, their physical and mental conditions fluctuate from day to day, even from hour to hour."

According to Greene, In any event, some increase of scores will probably result from the practice-effect.<sup>5</sup> Co-efficient of correlation, obtained by this method, is generally high.

3) The Split - half Method :

The first method needed two equivalent forms to administer them to the same group, and the second method needed to administer the same test twice to the same group at a suitable interval of time. "In the interest of economy, it becomes desirable to set up procedures for extracting an estimate of reliability from a single administration of a single test."<sup>6</sup>

In split-half method, a test is administered once only. The test is split up into two equivalent parts and the co-efficient of correlation between them is computed. This gives half test reliability. From the half-test reliability, the self-

correlation of the whole test is determined by applying the formula:

5. Greene H.A., Jorgensen A.N., Gerberich J.R., "Measurement and Evaluation in the Secondary School," Longmans, Green and Co., New York, 1955. P. 73.

6. Lindquist E.F., "Educational Measurement," American Council of Education, Washington, D.C. 1955. P. 579.



Spearman-Brown formula. ".... its main advantage is that all of the data for determining test reliability are obtained upon one occasion, hence variations introduced by differences between the two testing situations are eliminated." 7

Objection :

The test can be divided into two halves in a variety of ways. So, co-efficient of reliability is not a unique value. "This criticism is strictly true only when items are of equal difficulty when items are in strict order of merit from least to most difficult, the split into odds and evens gives a unique determination of the reliability coefficient." 8

According to Greene,<sup>9</sup> this is one of the most feasible methods for use with informal objective examinations for which ordinarily no second or alternate form is available.

4) The method of 'Rational Equivalence' :

In this method, the information about consistency of performance from item to item within the test have been utilised. It is free from the objections raised against the above three methods. Kuder and Richardson have devised a formula popularly known as  $K = R \cdot 20$  to estimate the reliability of the test. But the formula is very complicated and demands laborious calculations. This formula is modified by several research workers. One of the most useful and popular formulas <sup>10</sup> is as follows.

7. Garrett H.E., "Statistics in Psychology and Education," Longmans, Green and Co., 1951. P. 383.

8. Ibid. P. 383.

9. Greens H.A., Jorgensen A.N., Gerberich J.R., "Measurement and Evaluation in the Secondary School", Longmans, Green and Co., New York, 1955. P. 74

10. Garrett H.E., " Statistics in Psychology and Education" Longmans Green and Co., 1951. P. 384



$$r_{\text{II}} = \frac{n}{(n-1)} \times \frac{\sigma_t^2 - \beta p v}{\sigma_t^2}$$

in which :

- $r_{\text{II}}$  = reliability coefficient of whole test;
- $n$  = number of items in the test;
- $\sigma_t$  = The S.D. of the test scores;
- $p$  = the proportion of the group answering a test item correctly;
- $v$  =  $(1 - p)$  = The proportion of the group answering a test item incorrectly.

#### The Reliability of the present experiment :

The reliability of the present experiment has been computed by only one method viz. the split half method.

As mentioned above, it is difficult to prepare an alternate form of the test. "If only a single form of a test is needed for the research or practical use to which the test is to be put, it often seems unduly burdensome to prepare two separate tests merely in order to obtain an estimate of reliability."<sup>11</sup> Under the circumstances, it was not thought worthwhile to prepare an alternate form and so this method is not used in the present experiment to gauge the reliability.

#### 1) The split half method :

Three schools were selected at random and coefficient of correlation using the product moment formula were computed. The following table gives these correlations.

T A B L E No. 172

Reliability of the tests by the Split half method.

Subject:	Std. VII	Std. VI	Std. V
Gujarati	0.92	0.91	0.94
Hindi	0.90	0.99	0.91
Arithmetic	0.92	0.91	0.79
History	0.91	0.91	0.89
Geography	0.88	0.84	0.85
Science	0.94	0.92	0.90

<sup>11</sup>. Lindquist, E. F., "Educational Measurement" American Council on Education, Washington, D. C., 1955, P. 579.



(2) The Method of Rational Equivalence :

The reliability coefficient was computed by the above method using the formula :

$$\rho_{r,I} = \frac{n}{n-1} \times \frac{\sigma_e^2 - \rho_{r,U}}{\sigma_e^2}$$

The following table gives the results obtained.

T A B L E No. 173

The table showing results of reliability coefficient obtained by the method of Rational Equivalence.

Subject.	Std. VII	Std. VI	Std. V
Gujarati	0.91	0.91	0.94
Hindi	0.86	0.95	0.93
Arithmetic	0.92	0.87	0.81
History	0.86	0.92	0.90
Geography	0.87	0.81	0.84
Science	0.93	0.93	0.92

The Index of Reliability :

" An individual's "true score" on a test is defined as the mean of very large number of determinations made of the given person on the same test or parallel forms of the test administered under approximately identical conditions."<sup>12</sup> The correlation between a series of obtained scores and their corresponding theoretically "true" scores was found by the formula :

$$\rho_{r,\alpha} = \sqrt{\rho_{r,U}}$$

in which,

$\rho_{r,U}$  = the reliability coefficient of the given test

$\rho_{r,\alpha}$  = the correlation between obtained and true scores.

The index of reliability represents the maximum correlation which the given test is capable of yielding between the obtained and the true scores.

12. Garrett H.E. "Statistics in Psychology and Education," Longmans Green and Co., 1951, P. 391.



The following table gives the index of reliability of the eighteen tests for the Std. VII, VI and V

T A B L E No. 174

Subject	Std. VII	Std. VI	Std. V
Gujarati	0.96	0.95	0.97
Hindi	0.95	0.99	0.95
Arithmetic	0.96	0.95	0.89
History	0.95	0.95	0.94
Geography	0.94	0.92	0.92
Science	0.96	0.96	0.95

#### The reliability of the mean and the S.D.

The Standard errors of the above statistics have been computed and are given in the previous chapter along with these statistics.

#### The reliability of the sample :

About 8 percent of the schools in the city of Bombay had been selected for the purpose of testing at various stages. These were taken at random. These included children from all the strata of Society. The schools situated in almost every Municipal ward were included in the sample. Hence the sample can be considered as fairly representative of the population. However, the Chi-squared test for goodness of fit does not give satisfactory result for some of the tests. This may be due to the poor or extra ordinary teaching in the respective school subjects; because it has been found that the teaching efficiency in different schools was different and depended on various factors which need not be discussed here. However, looking to the results of the tests the sample is fairly reliable.

#### Validity of the Tests :

In some respects, the validation of an achievement test is more difficult than the validation of an intelligence test.



and a greater number of procedures are employed for its determination." 13. In discussing the validation of achievement test the following aspects should be considered.

- (1) The curricular validity;
- (2) The Statistical validity.

#### The Curricular Validity :

To establish the curricular validity, the syllabus of various subjects of Stds. VII, VI and V, nearly all the ~~Guji~~ - ~~textbooks~~ sanctioned by the Education Department of the old Bombay State, weightage assigned to the different topics in each subjects of each standard by the experienced teachers keeping in view the teaching periods and the weightage to these topics in the question papers set at the annual examinations and the total No. of pages allotted to each topics ; the text book writers have been critically studied. This study is discussed elaborately in Chapter II. The Blue Prints of this have been given there.

#### The Statistical Validity :

" Statistical validity refers to the mathematical process for determining the degree to which the test agrees with, or correlates with, some criterion which is set up as an acceptable measure of the thing in question. Some of these statistical procedures aim at validating the test as a whole and others validating the items individually." 14

##### (1) The practical validity :

- The practical validity of the tests can be checked by
- (a) comparing the test results with
    - (a) the school examination marks of the subjects,
    - (b) the teacher's rating
    - (c) such other tests believed to be a valid measure

13. Ross C.C., "Measurement in To-day's Schools", Prentice Hall Inc., 1956 P. 111. (14) Ibid. P. 112



2) The internal validity by computing the inter correlations.

The Annual Examination Marks :

It is a fact that the present examination are highly subjective. The marks obtained at the annual examinations are not so reliable. The pupil's score also depends upon the nature of question paper, the mood of the examiner and such other factors. "Inspite of the apparent unreliability of teachers' marks for refined measurements, an educational test that consistently picks out the pupils who, in the teachers' judgment of a specific ability, are superior or inferior probably do have significant validity." 15

Marks from three different schools in each of the subjects obtained by the candidate at the annual examination in standard VII, VI and V were collected. These were correlated with the test scores using the product-moment formula. The results of these correlations are given below:

T A B L E No. 175

Table showing the coefficient between the school marks and the test scores of candidates in three schools

studying in Standard VII

Subject	School A	School B	School C
Gujarati	0.21	0.55	0.28
Hindi	0.52	0.77	0.56
Arithmetic	0.51	0.68	0.55
History	0.67	0.52	0.58
Geography	0.47	0.59	0.45
Science	0.54	0.55	0.37

15. Greene H.A., Jorgensen A.N. Gerbarich J.R. "Measurement and Evaluation in the Secondary School." Longmans Green and Co., New York, 1955. P. 70.



T A B L E No. 176

Table showing the coefficient between the school marks  
and the test scores of candidates in three schools  
studying Standard VI

Subject	School A	School B	School C
Gujarati	0.53	0.54	0.37
Hindi	0.54	0.51	0.65
Arithmetic	0.44	0.68	0.46
History	0.40	0.45	0.73
Geography	0.81	0.53	0.59
Science	0.66	0.40	0.52

T A B L E No. 177

Table showing the coefficient between the school marks  
and the test scores of candidates in three schools  
studying standard V

Subject	School A	School B	School C
Gujarati	0.49	0.70	0.58
Hindi	0.57	0.57	0.53
Arithmetic	0.44	0.50	0.56
History	0.69	0.69	0.40
Geography	0.44	0.46	0.63
Science	0.51	0.74	0.59



b) The Teachers' Rating :

Each of the subject teachers teaching in the three classes of the three schools selected for the purpose of Reliability and Validity, was requested to estimate the pupils' proficiency in the subject and rank them accordingly to their achievement. The test scores of the pupils were correlated with these ranks using the Rank difference formula  $R = \frac{6 \sum d^2}{n(n^2 - 1)}$ .

The following tables give these correlations.

T A B L E No. 178

Coefficient of Correlations between the Teachers' estimates and scores on the tests using Spearman's Rank different method.

Subject	Std. VII			Std. VI			Std. V	
	School			School			A	B
	A	B	C	A	B	C	A	B
Gujarati	0.55	0.41	0.52	0.43	0.62	0.47	0.71	0.39
Hindi	0.62	0.72	0.57	0.61	0.64	0.61	0.75	0.57
Arithmetic	0.72	0.43	0.61	0.68	0.44	0.56	0.40	0.67
History	0.61	0.51	0.71	0.41	0.50	0.63	0.61	0.42
Geography	0.59	0.49	0.58	0.63	0.51	0.49	0.56	0.47
Science	0.66	1.62	0.39	0.60	0.56	0.62	0.63	0.59

The Internal Validity :

"The validity of a test also depends upon the team-work of the sub-tests. In a valid test, all the sub-tests show a good correlation with the whole battery." <sup>16</sup>

16. Desai K.G. "The Construction and Standardisation of a Battery of Group Tests of Intelligence in Gujarati". Bharat Prakashan, 1954; P. 186



In the present experiment, the test booklets of the same three classes referred to above were taken and the coefficient of correlation of scores in each of the sub-tests with the total scores in the whole test were correlated using the Product moment formula. The following tables give these results.

T A B L E No. 179

Std. VII

Sub test.	Subjects					
	Gujarati	Hindi	Arithmetic	History	Geography	Scienc
1	0.61	0.72	0.68	0.55	0.59	0.82
2	0.72	0.68	0.72	0.61	0.61	0.75
3	0.77	0.81	0.88	0.58	0.69	0.88
4	0.54	0.88	0.75	0.66	0.72	0.65
5	0.51	0.63	0.69	0.72	0.49	0.69
6	0.67	0.71	0.73	0.58	0.51	0.72
7	0.72	0.66	0.79	0.49	0.62	0.81
8	0.81	0.59	-	0.69	-	-
9	0.63	-	-	-	-	-

T A B L E No. 180

Std. VI

Sub Test	Subjects					
	Gujarati	Hindi	Arithmetic	History	Geography	Scienc
1	0.59	0.73	0.74	0.62	0.64	0.69
2	0.61	0.77	0.88	0.58	0.59	0.75
3	0.63	0.85	0.81	0.61	0.66	0.81
4	0.55	0.81	0.79	0.76	0.62	0.87
5	0.63	0.66	0.68	0.81	0.58	0.73
6	0.62	0.65	0.61	0.49	0.43	0.68
7	0.69	0.86	0.62	0.55	0.58	0.62
8	-	0.81	-	-	-	-



T A B L E No. 181

Std. V

Sub Test	Subject					
	Gujarati	Hindi	Arithmetic	History	Geography	Science
1	0.64	0.77	0.81	0.56	0.66	0.72
2	0.71	0.82	0.84	0.61	0.67	0.81
3	0.71	0.74	0.76	0.72	0.71	0.73
4	0.83	0.68	0.61	0.66	0.72	0.63
5	0.82	0.71	0.75	0.59	0.55	0.64
6	0.77	0.81	0.59	0.65	0.49	0.81
7	0.69	0.73	0.81	0.49	0.56	0.73
8	0.72	0.77	-	0.53	0.62	-

It can be observed from the above tables that all the correlation with the exceptions of very few are above 0.50 which shows that all the sub-tests are in good agreement with the whole test in each of the subject of Std. VII, VI and V. Hence it can be observed with confidence that all the tests are valid.

Conclusions :

A glance at the above tables which show the Reliability and Validity computed by using different methods show that all the tests are both valid and reliable.